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THE

JOURNAL

OF

THE ASIATIC SOCIETY

OF

BENGAL.

—

VOL. VI.

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THE
JOURNAL
OF
THE ASIATIC SOCIETY
OF
BENGAL.

EDITED BY

JAMES PRINSEP, F. R. S.

SECRETARY OF THE ASIATIC SOCIETY OF BENGAL; HON. MEM. OF THE AS. SOC.
OF PARIS; COR. MEM. OF THE ZOOLOGICAL SOC. OF LONDON, AND OF THE
ROYAL SOCIETIES OF MARSEILLES AND CAEN; OF THE ACADEMY
OF NATURAL SCIENCES OF PHILADELPHIA; OF THE
PHILOSOPHICAL SOCIETY OF GENEVA; OF
THE ALBANY INSTITUTE, &c.

VOL. VI.

JANUARY TO DECEMBER,
1837.

“ It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and will die away, if they shall entirely cease.”

SIR WM. JONES.

Calcutta :

PRINTED AT THE BAPTIST MISSION PRESS CIRCULAR ROAD.
SOLD BY THE EDITOR, AT THE SOCIETY'S OFFICE.

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VOL. VI.—PART I.

JANUARY TO JUNE,
1837.

“ It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta ; it will languish, if such communications shall be long intermitted ; and will die away, if they shall entirely cease.”

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PREFACE.

WE have the pleasure of closing this sixth volume of our Journal with an unexpected announcement:—the last steam packet has brought out instructions from the Honorable Court of Directors to the Government of India to “subscribe in their name for FORTY copies of the Journal of the Asiatic Society from the commencement of its publication !” We forbear to comment upon an act of liberality by which we shall personally be such a gainer, but which we have neither directly nor indirectly solicited. We can easily imagine to whose friendly influence we are indebted for it, and we hope he will accept our acknowledgments. Our principal difficulty will be how to meet the wishes of the court ; for of our early volumes not a volume is now to be procured ! We must seriously consider the expediency of a reprint, for we have even heard it whispered that an American edition was in contemplation, and such a thing cannot be deemed impossible when we find the Philadelphians undertaking to rival us of Calcutta in printing (and that without government support) a Cochinchinese dictionary* !

Of local support we have lost nothing by the measure we reluctantly adopted at the beginning of the year, of raising the price of the journal from one to one and a half rupee per number. Our list is fuller than ever, and our balance sheet of a much more promising aspect.

* M. P. ST. DUPONCEAU thus writes to M. JACQUET of Paris : “ J’ai maintenant le plaisir de vous informer que la Société philosophique Americaine vient d’ordonner l’impression à ses frais dex deux vocabulaires donnès à Mr. WHITE par le R. de MORRONE, ils vont être publiès dans un volume des memoires de son comitè d’histoire et de literature, etant trop volumineux pour faire partie de ses Transactions philosophiques.

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To balance due 1st January,	1,304	2	11	By collections this year, ..	3,455	2	8
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To postage ditto, ..	48	3	0	By balance due,	2,488	10	6
	7,933	0	8		7,933	0	8
Bills for 1837 due say, ..	6,000	0	0	Collections due by Asiatic Soc. and subs. in the three Presidencies, }	7,139	7	5
Add former balance, ..	2,488	10	6				

The deficiency, supposing all to be recoverable, is 1,349 13 1, or almost precisely what it was last year; so that our present price exactly pays the expenses of publication.

The bulk of the volume has gone increasing at the usual rate, and instead of eight hundred pages, we have now risen to eleven hundred, with sixty plates; too much to be conveniently bound up in one volume. We have therefore provided separate title pages to enable those, who so prefer, to divide the annual volume into two parts with an index, common to both, at the conclusion of the second part.

The prominent subject of public discussion (to imitate the order of preceding prefaces) as far as the Asiatic Society is concerned, has been THE MUSEUM,—the memorial to the local government—now under reference to the Court of Directors,—suggesting that the Society's collection of antiquities and natural history should form the nucleus of an extensive national establishment, in the present day almost “an essential engine of education, instructive alike to the uninformed, who admires the wonders of nature through the eye alone, and to the refined student who seeks in these repositories what it would be quite out of his power to procure with his own means.” It is to be hoped that this appeal to the court will not share the fate of the oriental publication memorial of 1835, which is still unacknowledged; but that we shall soon have an answer embracing the united objects of the Society's solicitude, and enabling her to advance boldly in her schemes to secure for herself, and for the British name the glory of placing ‘India physical, moral, and historical,’ upon the records of literature. What could be adduced as a more convincing ‘argumentum’ (*ad ignorantiam* dare we say?) than the fact that at this moment a French gen-

tleman of fortune well grounded in Sanskrit and other oriental studies at Paris, is come to Calcutta, 'about to retrace the steps of the French naturalists DUVAUCEL and JACQUEMONT in the interest of the antiquarian, as they travelled in that of the physical sciences.' He contemplates exploring *Gaur*, *Patiliputra*, *Magadha*, *Mithila*, *Kási*, *Ayudhya*, *Nipál*, *Kemaon*, the *Panjáb* *Affghanistán*, *Tibet*; then the *Jain* provinces, as they may be called, of *Márwár* and *Málwá*, and finally the cave antiquities of Western India*.

We wish M. THEROULDE every success, we proffer him every aid; yet we do so not without a blush that any thing should be left for a foreigner to explore! India, however, is large enough for us all to run over without jostling, and we cannot allow that inactivity is at the present moment a reproach against our Society or our governors. We have expeditions in *Cashmir*, *Sinde*, *Bhotán*, *Ava*, *Maulmain*, all well provided with scientific adjuncts, and contributing to our maps, our cabinets, and our commerce. Our Societies were never more vigorous. The Agricultural of Calcutta is become exceedingly active. The Geographical of Bombay has opened the field with an interesting volume and a journal of proceedings; and in science we have to boast of the brilliant progress of experiment and magnetic discovery due to one whom we should be happy at having enlisted among our own members. With his colleagues of the Medical College,

* We cannot omit to notice here another laudable demonstration of the greater honor that awaits literary merit at Paris than in London—making full allowance for the proverbial truth that a prophet must seek honor out of his own country. We have just learnt that the French Government has ordered a gold medal to be struck for, and the decoration of the Legion of Honour to be bestowed on Mr. B. H. HOBGSON, in return for the valuable donation of Sanskrit manuscripts presented by him to the Asiatic Society of Paris,—and in token of their appreciation of the great services he has rendered to oriental literature. Neither in this case is the reward blindly given, nor the present disregarded; for we know that the Sanskrit scholars of Paris have already dipped profoundly into the contents of the Nipalese Buddhist volumes, and in a short time we may expect a full analysis of them. As a comment on this announcement we may add that similar donations more extensive and more valuable were long since presented by the same party to the Royal Asiatic Society and to the College of Fort William, and that (with exception of the Tibetan portion so well analysed by M. CSOMA) they remain as yet sealed books.

Professor O'SHAUGHNESSY has drawn off to their own valuable publication, the subjects of chemical and physical interest to which we should otherwise have felt ourselves blameable in not offering a conspicuous place. While far different occupations have prevented our passing in review the very promising discoveries in this novel and enticing science, to which their public exhibition has now familiarized the society of Calcutta, the sight of models of magnetic motors and explosive engines worked by gas and spark, both generated by galvanism alone, leads us to suggest that mechanics and the arts should have been included among the proper objects of our projected national museum. An Adelaide gallery would do more to improve the native mind for invention than all the English printed works we would place before them.

But we are as usual wandering from the legitimate objects of a preface. Our own attention has been principally taken up this last year with Inscriptions. Without the knowledge necessary to read and criticise them thoroughly, we have nevertheless made a fortunate acquisition in palæography which has served as the key to a large series of ancient writings hitherto concealed from our knowledge. We cannot consent to quit the pursuit until we shall have satiated our curiosity by a scrutiny of all these records—records as Dr. MILL says, “which are all but certainly established to belong to and to illustrate a most classical and important part of the history of this country.” In our hasty and undigested mode of publication, we are doubtless open to continual corrections and change of views: as a talented and amusing satire on our present predilection for old stones and old coins, in the *Meernt Magazine* describes it,—‘if not satisfied with one account our readers have only to wait for the next journal to find it discarded and another adopted, as in the case of the Bactro-pehlevi alphabet.’

The learned M. E. BURNOUR in a most interesting article inserted in the *Journal des Savans* for June,* says, alluding to the Burmese inscription at *Gaya* published first in the journal, and

* On the grand work of the Chinese Buddhist traveller FOE KOUE KI, lately published at the expense of the French Government, through the labour of three successive editors MM. REMUSAT, KLAPROTH and LANDRESSE. Alas! when shall we in India have an opportunity of seeing these works at any tolerable period after their publication?—ED.

afterwards more completely commented upon by Colonel BURNES,—“ il faut le dire à l'honneur des membres de la Société Asiatique du Bengale, le zèle qui les anime pour l'étude des antiquités de l'Inde est si soutenu et si heureusement secondé par la plus belle position dans laquelle une réunion de savants ne soit jamais trouvée, que les monuments et les textes qu'ils mettent chaque jour en lumière se succèdent avec une rapidité que la critique peut à peine suivre.” While they are taken up with an object once published, we are republishing or revising or adding more matured illustration to it. Some may call this system an inconvenient waste of space and tax on readers, who are entitled to have their repast served up in the most complete style at once, and should not be tantalized with fresh yet immature morceaux from month to month. We, however, think the plan adopted is most suitable to an ephemeral journal, which collects materials and builds up the best structure for immediate accommodation, although it may be soon destined to be knocked down again and replaced by a more polished and classical edifice :—*diruit ædificat ; mutat quadrata rotundis*,—may still be said of our journal, without imputing capricious motives to our habit of demolition. We build not fanciful theories, but rather collect good stones for others to fashion, and unless we advertize them from the first, with some hint of their applicability, how should architects be invited to inspect and convert them to the “benefit and pleasure of mankind?”—*hitasukhāya manusānam*,—as the stone pillars at *Delhi* and *Allahabad* quaintly express the object of their erection.

Connected with the subject of these remarks we would fain in this place give insertion (and we will do so hereafter) to a valuable series of criticisms on the matter of our last volume contained in M. JACQUET'S correspondence. It is just what we most desire. With the aid of an index, such additional information and correction is as good as if incorporated with the text, to the reader who in future days wishes to ferret out all that has been done on a particular subject ; and we would have all our contributors and readers bear in mind that our journal, though it has long changed its title, does not pretend to have changed its original character of being a mere collection of “Gleanings.”

Calcutta, 1st January, 1838.

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CONTENTS.

No. 61.—JANUARY.

Page

I.—Restoration and Translation of the Inscription on the Bhitári Lát, with critical and historical remarks. By the Rev. W. H. Mill, D. D., Principal of Bishop's College, Vice-President, &c. &c.	1
II.—Alphabets of the Tai language. By the Rev. N. Brown, Missionary in Assam,	17
III.—Remarks on the Silkworms and Silks of Assam. By Mr. Thomas Hugon, Sub-Asst. Nowgong,	21
IV.—On the indigenous Silkworms of India. By T. W. Helfer, M. D. Member of the Medical Faculties at the Universities in Prague and Pavia, Member of the Entom. Society in Paris, &c.	38
V.—Concerning certain interesting Phenomena manifested in individuals born blind, and in those having little or no recollection of that sense, on their being restored to sight at various periods of life. By F. H. Brett, Esq. Med. Service,	47
VI.—Memorandum of the progress of sinking a Well in the bunds of Chandpur, near the foot of the Hills. By Mr. William Dave, Conductor, Delhi Canal Department,	52
VII.—The History of Labong from the Native Records consulted by Dr. D. Richardson, forming an Appendix to his journals published in the preceding volume,	55
VIII.—Suggestions on the Sites of Sangala and the Altars of Alexander, being an extract from Notes of a Journey from Lahore to Karychee, made in 1830. By C. Masson,	57
IX.—Chinese Account of India. Translated from the Wan-hëen-t'hung-kaou, or 'Deep Researches into Ancient Monuments;' by Ma-twanlin; book 338, fol. 14,	61
X.—Proceedings of the Asiatic Society,	77
XI.—Meteorological Register,	80

No. 62.—FEBRUARY.

I.—Singular narrative of the Armenian king Arsaces and his contemporary Sapor, king of Persia; extracted from the Armenian chronicles. By Johannes Avdall, Esq. M. A. S.	81
II.—Translation of an Inscription on a stone in the Asiatic Society's Museum, marked No. 2. By Captain G. T. Marshall, Examiner in the College of Fort William,	88
III.—On the explanation of the Indo-Scythic legends of the Bactrian Coins, through the medium of the Celtic. By Dr. J. Swiney,	98
IV.—On three new Genera or sub-Genera of long-legged Thrushes, with descriptions of their species. By B. H. Hodgson, Esq.	101
V.—Description of three new species of Woodpecker. By B. H. Hodgson, Esq.	104
VI.—Indication of a new Genus of Incessorial Birds. By B. H. Hodgson, Esq.	110
VII.—Nest of the Bengal Vulture, (<i>Vultur Bengalensis</i> ;) with observations on the power of scent ascribed to the Vulture tribe. By Lieut. J. Hutton,	112

	<i>Page</i>
VIII.—Notes taken at the post-mortem examination of a Musk Deer. By A. Campbell, Esq., Nipal Residency, June 24, 1834,	118
IX.—Some account of the Wars between Burmah and China, together with the journals and routes of three different Embassies sent to Peking by the king of Ava; taken from Burmese documents. By Lieutenant-Colonel H. Burney, Resident in Ava,	121
X.—Notice on <i>Balantium</i> , a genus of the Pteropodous Mollusca; with the characters of a new species inhabiting the Southern Indian Ocean. By W. H. Benson, Esq. B. C. S.	150
XI.—Additional fragments of the <i>Sivatherium</i> ,	152
XII.—Note on the Hotspring of Lohand Khad. By Capt. C. M. Wade,.. .. .	153
XIII.—Proceedings of the Asiatic Society,	154
XIV.—Meteorological Register,	160

No. 63.—MARCH.

I.—Remarks on M. Schlegel's objections to the restored editions of the <i>Alif Leilah</i> , or Arabian Nights' Entertainments. By Henry Torrens, Esq. B. A. and of the Inner Temple, B. C. S.	161
II.—Journal of Captain C. M. Wade's voyage from Lodiāna to Mithankot by the river Satlaj, on his Mission to Lahór and Baháwalpur in 1832-33. By Lieut. F. Mackeson, 14th Regt. N. I.	169
III.—Facsimiles of Ancient Inscriptions,	218
IV.—Note on a Specimen of the <i>Bos Gaurus</i> . By Dr. George Evans, Curator of the Medical College,	223
V.—Memorandum on the Gaur and Gayal. By Assistant Surgeon J. T. Pearson, Cur. Mus. Asiatic Society,	225
VI.—On a new Genus of the <i>Sylviadæ</i> , with description of three new Species. By B. H. Hodgson, Esq. Resident in Nipal,	230
VII.—Note on the occurrence of Fossil Bones in the Sewalik Range, eastward of Hardwar. By H. Falconer, M. D., Superintendent Botanical Garden, Sháranpur,	233
VIII.—Report progress of the Boring Experiment in Fort William. By Major T. M. Taylor, 5th Cav.	234
IX.—Proceedings of the Asiatic Society,	233
X.—Meteorological Register,	245

No. 64.—APRIL.

I.—Abstract of the Journal of a Route travelled by Capt. S. F. Hannay, of the 40th Regiment Native Infantry, from the Capital of Ava to the Amber Mines of the Hákong valley on the South-east frontier of Assam. By Capt. R. Boileau Pemberton, 44th Regt. N. I.	245
II.—Facsimiles of Ancient Inscriptions. By Jas. Prinsep, Sec. &c.	273
III.—Specimens of Hindu Coins descended from the Parthian type, and of the Ancient Coins of Ceylon. By James Prinsep, Sec. As. Soc.	289
IV.—On the Revolution of the Seasons, (continued from Vol. IV. p. 257.) By the Rev. R. Everest,	303
V.—On the Climate of Darjiling,	308
VI.—Note on the Genera <i>Oxygyrus</i> and <i>Bellerophon</i> . By W. H. Benson, Esq. B. C. S.	316
VII.—Proceedings of the Asiatic Society,	317
VIII.—Meteorological Register,	324

No. 65.—MAY.

Page

I.—Journal of a visit to the Mishmee hills in Assam. By Wm Griffith, M. D.	
Madras Medical Establishment,	325
II.—Corrected Estimate of the risk of life to Civil Servants of the Bengal Presidency. By H. T. Prinsep, Esq. Sec. to Govt. &c.	341
III.—A Grammar of the Sindhí language, dedicated to the Right Honorable Sir Robert Grant, Governor of Bombay. By W. H. Wathen, Esq.	347
IV.—On additional fossil species of the order Quadrumana from the Sewálík Hills. By H. Falconer, M. D. and Captain P. T. Cautley,	354
V.—On some new Genera of Raptores, with remarks on the old genera. By B. H. Hodgson, Esq.	361
VI.—Observations of the Magnetic Dip and Intensity at Madras. By T. G. Taylor, Esq. H. C. Astronomer,	374
VII.—The Legends of the Saurashtra group of Coins deciphered. By James Prinsep, Sec. As. Soc.	377
VIII.—On the Properties ascribed in Native medical works to the Acacia Arabica. By Lewis Da Costa, Esq.	392
IX.—Proceedings of the Asiatic Society,	397
X.—Meteorological Register,	404

No. 66.—JUNE.

I.—Some account of the Wars between Burmah and China, together with the journals and routes of three different Embassies sent to Peking by the king of Ava : taken from Burmese documents. By Lieutenant-Colonel H. Burney, Resident in Ava,	405
II.—Note on the Facsimiles of Inscriptions from Sanchí near Bhilsa, taken for the Society by Captain Ed. Smith, Engineers ; and on the drawings of the Buddhist monument presented by Captain W. Murray, at the meeting of the 7th June. By James Prinsep, Sec. As. Soc.	451
III.—Notice of a Colossal Alto-Relievo, known by the name of Mata Koonr situated near Kussía Tannah, in Pergunnah Sidowa, Eastern Division of Gorakhpur District. By D. Liston, Esq.	477
IV.—Translation of one of the Grauthas, or sacred books, of the Dadupanthi Sect. By Lieut. G. R. Siddons, 1st Light Cav., Second in command, 3rd Local Horse, Neemuch,	480
V.—Notice of new Sites of Fossil deposits in the Nerbudda Valley. By Dr. G. G. Spilsbury. Pl. XXX.	487
VI.—New species of Scolopacidæ, Indian Snipes,	489
VII.—Proceedings of the Asiatic Society,	490
VIII.—Meteorological Register,	500

No. 67.—JULY.

I.—An Examination of the Páli Buddhistical Annals. By the Hon'ble George Turnour, Esq. of the Ceylon Civil Service,	501
II.—On the " Indian Boa," " Python Tigris." By Lieut. T. Hutton,	528
III.—Notice of a skull (fragment) of a gigantic fossil Batrachian. By Dr. T. Cantor,	538
IV.—Some account of the Wars between Burmah and China, together with the journals and routes of three different Embassies sent to Peking by the King of Ava : taken from Burmese documents. By Lieutenant-Colonel H. Burney, Resident in Ava,	542
V.—On a new genus of the Plantigrades. By B. H. Hodgson, Esq.	560

	<i>Page</i>
VI.—Interpretation of the most ancient of the inscriptions on the pillar called the lát of Feroz Sháh, near Delhi, and of the Allahabad, Radhia and Mat-tiah pillar, or lát, inscriptions which agree therewith. By James Prinsep, Sec. As. Soc. &c.	566
VII.—Abstract of a Meteorological Register kept at the Cathmandu Residency for 1837. By A. Campbell, Esq. M. D. Nipal Residency,	610
VIII.—Proceedings of the Asiatic Society,	612
IX.—Miscellaneous :	
1.—Proportion of rain for different lunar periods at Kandy, Island of Ceylon,	618
2.—Memorandum of the fall of the Barometer at Macao during the severe Hurricane, on the 5th and 6th August, 1835,	619
3.—Award of medals by the Geological Society of London,	<i>ib.</i>
X.—Meteorological Register,	620

No. 68.—AUGUST.

I.—History of the Gurba Mundala Rájas. By Captain W. H. Sleeman, Commissioner for the suppression of Thuggee in the Nerbudda provinces,	621
II.—Account of the Ruins and Site of old Mandavi in Raepur, and legend of Vikramáditya's Son in Cutch. By Lieut. W. Postans, Bombay Engineers,	648
III.—Catalogue of Geological Specimens from Kemaon presented to the Asiatic Society. By Dr. J. McClelland,	653
IV.—Facsimiles of Ancient Inscriptions, lithographed by James Prinsep, Sec. As. Soc. &c.	663
V.—Note on the Primary language of the Buddhist writings. By B. H. Hodgson, Esq. Resident in Nipal,	662
VI.—Geometric Tortoises, "Testudo Geometrica." By Lieut. T. Hutton, 37th Native Infantry,	689
VII.—Barometrical elevations taken on a journey from Katmandhu to Gosainsthán, a place of pilgrimage in the mountains of Nipal, by Chhedí Lohar, a smith in the employ of Captain Robinson, late commanding the Escort of the Resident in Nipal,	696
VIII.—Meteorological Register kept at Darjiling for the months of April, May, June, and July, 1837. By Dr. H. Chapman,	700
IX.—Proceedings of the Asiatic Society,	704
X.—Tribute of the Pandits to the Rev. Dr. MILL,	710
XI.—Meteorological Register,	712

No. 69.—SEPTEMBER.

I.—An examination of the Páli Buddhistical Annals, No. 2. By the Hon'ble George Turnour, Esq., Ceylon Civil Service,	713
II.—Note on the Geography of Cochin China, by the Right Rev. Jean Louis, Bishop of Isauropolis, Vicar Apostolic of Cochin China, Hou. Mem. As. Soc.	737
III.—On the Bibos, Gauri Gáu or Gauriká Gau of the Indian forests. By B. H. Hodgson, Esq. Resident in Nepal,	745
IV.—Extracts translated from the Granthas or sacred books of the Dadupanthí Sect. By Lieutenant G. R. Siddons, 1st Light Cavalry, Second in command, 3rd Local Horse, Neemuch,	750
V.—History of the Rájas of Orissa, from the reign of Rája Yudhistira, translated from the Vansávali. By the late Andrew Stirling, Esq. C. S.	756

VI.—Some account of the valley of Kashmír, Ghazni, and Kábul; in a letter from G. J. Vigne, Esq. dated Bunderpore, on the Wuler lake, Kashmír, June 16, 1837,	766
VII.—Account of an Inscription found by Mr. H. S. Boulderson, in the Neighbourhood of Bareilly. By James Prinsep, Sec. &c.	777
VIII.—Section of the strata passed through in an experimental boring at the town of Gogah, on the Gujerat peninsula, Gulph of Camhay. By Lieutenant George Fulljames,	786
IX.—Note on the black and brown Florikeu of Guzerat. By Lieutenant George Fulljames,	789
X.—Further elucidation of the lát or Slasthambha inscriptions from various sources. By James Prinsep, Sec. As. Soc.	790
XI.—Proceedings of the Asiatic Society,	797
XII.—Meteorological Register,	804

No. 70.—OCTOBER.

I.—Extracts from the Mohit, (the Ocean.) a Turkish work on Navigation in the Indian Seas. Translated and communicated by Joseph Von Hammer, Baron Purgstall, Aulic Counsellor, and Prof. Orient. Lang. at Vienna, Hon. Memb. As. Soc. &c. &c.	805
II.—Observations upon the past and present condition of Oujein or Ujjayani. By Lieutenant Edward Conolly, 6th Light Cavalry,	813
III.—Account of the Tooth relic of Ceylon, supposed to be alluded to in the opening passage of the Feroz lát inscription. By the Hon'ble George Tournour, Esq. Ceylon Civil Service,	856
IV.—Facsimiles of ancient inscriptions, lithographed by James Prinsep, Sec. As. Soc. &c. &c.	869
V.—Meteorological Register kept at Darjiling for August, 1837. By Dr. H. Chapman,	888
VI.—Abstract of Meteorological Register kept at the Cathmandu Residency for July and August, 1837. By A. Campbell, Esq. Nipal Residency,	889
VII.—Proceedings of the Asiatic Society,	890
VIII.—Meteorological Register,	900

No. 71.—NOVEMBER.

I.—Journal of a Trip to the Burenda Pass in 1836. By Lieut. Thomas Hut- ton, 37th Regiment, Native Infantry,	901
II.—Discovery of the Rekhá Ganita, a translation of the Elements of Euclid into Sanskrit by Samráť Jagaunátha, under the orders of Rája Siwái Jaya Sinha of Jaipur. By Lancelot Wilkinson, Esq. C. S. Resident at Bhopál, 938	
III.—Observations of the Tides at Chittagong made in conformity with the Circular of the Asiatic Society. By Lieut. H. Siddons, Engineers,	949
IV.—Translation of a Servitude-Bond granted by a Cultivator over his Family, and of a Deed of Sale of two slaves. By D. Liston, Esq. Gorakhpur,	950
V.—Note on the Malay Woodpecker. By Dr. William Bland, Surgeon of H. M. S. Wolf,	952
VI.—Notes on the Musical Instruments and Agricultural and other Instruments of the Nipalese. By A. Campbell, Esq. M. D. Surgeon attached to the Residency at Katmandhu,	953
VII.—Note on the Facsimiles of the various Inscriptions on the ancient column at Allahabad, retaken by Captain Edward Smith, Engineers. By James Prinsep, Sec. As. Soc. &c. &c.	963

	<i>Page</i>
VIII.—Interpretation of the Ahom extract published as Plate IV. of the January number of the present volume. By Major F. Jenkins, Commissioner in Assam,	980
IX.—Proceedings of the Asiatic Society,	984
X.—Meteorological Register,	988

No. 72.—DECEMBER.

I.—Abstract Journal of an Expedition to Kiang Hung on the Chinese Frontier starting from Moulmein on the 13th December, 1836. By Lient. T. E. MacLeod, Assistant to the Commissioner of the Tenasserim Provinces, with a route map,	989
II.—Abstract Journal of an expedition from Moulmein to Ava through the Kareen country, between December 1836 and June 1837. By D. Richardson, Esq. Surgeon to the Commissioner of the Tenasserim Provinces, ..	1005
III.—Comparison of Indo-Chinese Languages by the Rev. N. Brown, American Missionary stationed at Sadiya at the north-eastern extremity of Assám,..	1023
IV.—Specimens of Buddhist Inscriptions, with symbols, from the west of India. By Colonel W. H. Sykes, Hon. Mem., As. Soc.	1038
V.—Further notes on the inscriptions on the columns at Delhi, Allahabad, Betiah, &c. By the Hon'ble George Turnour, Esq. of the Ceylon Civil Service,	1049
VI.—Account and drawing of two Burmese Bells now placed in a Hindu temple in Upper India. By Capt. R. Wroughton, Revenue Surveyor, Agra division,	1064
VII.—Note on Inscription at Udayagiri and Khandgiri in Cuttack, in the lát character. By Jas. Prinsep, Sec. As. Soc. &c.	1072
VIII.—Memorandum regarding specimens from Seoní Chupara. Pl. LVI. By D. W. McLeod, Esq.	1091
IX.—Proceedings of the Asiatic Society,	1092
X.—Meteorological Register,	1100

ERRATA.

Page line

IN No. 26, (VOL. II.) OF THE JOURNAL.

- 89, 26, for 'the first specimens,' read 'the finest.'
 93, 29, read 'No. 17 Lymnæa,.... (mihī)—limosa ?'
 523, 3, for 'knee,' read 'neck.'

IN THE JOURNAL FOR 1836.

- 733, 7, from bottom, read 'granular matter, the fovilla, and bursts if the immersion is somewhat protracted.'
 812, 21, *dele* the proposed name Cyananthus, which is already appropriated in Dr. WALICH's catalogue.
 829, 3, from bottom, for 'interesting,' read 'intimate.'

- 348, 6, after 'to this' insert 'day.'
 350, 44, for '2,3. Hunda,' read '2. Hunda.'
 377, 3, from below, for 'a,' read 'an.'
 384, 9, from below, for 'general,' read 'generic.'
 386, 22, after written insert semicolon.
 387, 4, from below, for 'صور' read 'صورت'
 392, 4, for 'unexpected,' read 'unsuspected.'
 391, 12, for 'Denavāgri,' read 'Devanāgari.'
 460, 35, for '३१' read '५१'
 467, 19, for 'Parthia,' read 'Bactria.'
 468, 21, for 'the Sanchi,' read 'at Sanchi.'

The vowel mark *e* has been broken off under the press in a great many passages of the Sanskrit readings of the Delhi inscription in the July number, particularly in the word *mé*.

- 581, 7, after 'by,' insert 'the.'
 583, 5, of notes, for 'nimitat,' read 'nimita.'
 584, 12, ditto *dele* 'm' after 'esa.'
 585, 9, ditto for 'junè,' read 'janè.'
 — 20, ditto for 'participular,' read 'participular.'
 594, 25, ditto for 'adopting,' read 'adapting.'
 595, 12, ditto for 'nacshatras,' read 'nacshatric.'
 603, 11, ditto for 'dhara,' read 'ādhāra.'—
 604, 4, ditto for 'neat,' read 'next.'
 608, 6, ditto for 'you,' read 'thou.'
 — 19, ditto for 'Kahgur,' read 'Kahgyur.'
 676, 7, for 'this powerful,' read 'his powerful.'
 — 3, from below, for 'ayantaliyam,' read 'anantaliyam.'
 766, 29, for '24° 13½,' read '24 miles: 13½.'
 779, 2, and 5, for 'is,' read 'are.'
 791, 8, for 'Chadaguttassa,' read 'Chandaguttassa.'
 — 17, for 'leaæes,' read 'leaves.'
 794, 7, after quarter, insert full point.
 — 3, from bottom, for 'very,' read 'verb.'
 795, 30, for 'papey,' read 'paper.'
 — last line, for 'वढ' read 'वट.'

- 876, 1, for 'توفي يوم الثلاثاء' read 'توفي يوم الثلاثاء' and in the translation, line 14, for 'WAD,' read 'WALD,' (or WALR,) and for 'Monday,' read 'Tuesday.'

- 884, 7, for 'वसारि,' read 'विसारि.'
 13, for 'आयातरम्यं,' read 'आपातरम्यं.'
 19, for 'विशोधि,' read 'विष्माधि.'
 976, 3, for 'स्फुट,' read 'स्फुट.'
 4, for 'हसु,' read 'हासु.'
 6, for 'तलो,' read 'तलो.'
 13, for 'सादिकेनाथेनचत्तो,' read 'सादिकेनाथेनचत्तो.'
 977, 18, for 'जाद्वनेरणा,' read 'जनोद्वरेणा.'

942, [The extract from the Rekha Ganita differs very materially from the copy in the College here, and the following passage in page 944, after the word *भवति* in line 7 is required to complete the explanation of the figure:

तद्विशिनद्धितयोः रेखयोरन्तरसु सेचरसधिकमेव भवति यचात्प मन्तं
 The rest are additions to the preface which it is less necessary to correct.]

LIST OF PLATES.

Plate I. (XXXII. of vol. V.) Bhitári Lát inscription, to face page	1
II. Alphabets of the Tai language,	19
III. Specimen of the Khamti writing,	20
IV. Specimen of the Ahom language,.....	<i>ibid.</i>
V. The Eria silkworm of Assam, <i>Phalæna cynthea</i> ,	23
VI. The Moonga silkworm of ditto, <i>Saturnia Assamensis</i> ,.....	30
VII. Facsimiles of an inscription in the Asiatic Society's Museum, translated by Captain Marshall,	89
VIII. Occiput of the <i>Sivatherium</i> ,	152
IX. Lower jaw of the same fossil animal,	152
X. Inscription of Dipaldinna at Amarávati,	218
XI. Another inscription from the same place,	222
XII. Fossil shells of the <i>Chári</i> range in <i>Cutch</i> ,	159
XIII. Alphabet of the Amarávati character,	222
XIV. XV. Indo-Sassanian Coins,	288
XVI. Head of the <i>Bos Gaurus</i> (?) or <i>Gayal</i> ,	224
XVII. Facsimile of Museum Inscription, No. 6,	280
XVIII. Fossil bone brought up in the boring in Fort William; head of the <i>Bos Gaurus</i> (museum); and fossil quadrumanous tooth,...	236
XIX. Map of Captain Hannay's route,	245
XX. Ceylon Coins,	298
XXI. Diagram of moon's declination; coluber mycterizans, and fossil bone from Fort boring,	304
XXII. Sindhi and Multani alphabets,	352
XXIII. Fossil Qaudrumana of the Sewálíks,	360
XXIV. Legends on Saurashtra coins,	382
XXV. Principal Inscription at Sanchi,	454
XXVI. Second Inscription from the same place,	458
XXVII. Various smaller ditto in the Lát character,	460
XXVIII. View of the Sanchi Monument, ..	452
XXIX. Details of the Architecture of ditto,	452
XXX. Fossil fore-leg of an elephant from Jabalpur,	488
XXXI. Head of a fossil Batrachian,	540
XXXII. Inscription in <i>Hala Kanadu</i> , and Kalinjer inscription,.....	665
XXXIII. Gumsar copper-plate Grant,	666
XXXIV. } XXXV. } Inscriptions from the Caves near Gaya, XXXVI. }	{ 672 676 676

XXXVII.	Inscription on a fragment of rock at Singapur,	680
XXXVIII.	The <i>Testudo geometrica</i> ,.....	696
XXXIX.	Osteology of the Bibos, or Gauri Gau,.....	748
XL.	Rèstoration of the <i>Allahabad</i> pillar, ..	798
XLI.	<i>Bareilly</i> inscription,	778
XLII.	<i>Delhi</i> lát inscription,	796
XLIII.	Town of Oujein, and water-palace,	813
XLIV.	Facsimile of Multai copper-plate Grant,	868
XLV.	Ditto of Epitaph on an Arabic tombstone, ..	873
XLVI.	Ditto of an Inscription from Cabul,	876
XLVII.	Sketch of the Khaiber Tope,	876
XLVIII.	Inscription in As. Soc. Museum, from Calinjer,	881
XLIX.	Map of Capt. McLeod's route to Zimmay,	989
L.	Diagrams of the <i>Rekhá Ganita</i> , ..	948
L. & LI.	Burmese Bells,	1068
LII.	Map to illustrate geology of Seoni, Jabalpur,	1092
LIII.	Inscriptions from the Sainhadri caves,	1044
LIV.	Udayagiri Inscriptions,	1080
LV.	Inscription No. 2 of the <i>Allahabad</i> pillar,.....	978
LVI.	Various fragments of ditto,.....	968
LVII.	Inscription on the <i>Khandgiri</i> rocks,	1090



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I.—*Journal of a visit to the Mishmee hills in Assam.* By WM. GRIFFITH, M. D. Madras Medical Establishment.

[In a letter to Captain F. JENKINS, Political Agent, N. E. Frontier; communicated by Government to the Asiatic Society, the 5th April, 1837.]

In pursuance of my intention of visiting the *Mishmee* hills, as soon as the season was sufficiently advanced, I left this station on the 15th October, and proceeded up the *Brahmapútra*, or *Lohit*, to the mouth of the *Karam Pánee*, which we reached on the third day. I thence ascended this river, which is a mere mountain stream, for a similar period, at the expiration of which I had reached its extreme navigable point at that season of the year, even for the small boats which I employed. At *Chonpúra* the rapids of the *Brahmapútra* commence, and thence they increase rapidly in frequency and violence; so much so, that the river is only navigable for small boats one day's journey above the mouth of the *Karam*. No villages exist on the great river, the extreme banks of which are clothed with heavy tree jungle. It is much subdivided by islets formed of accumulations of sand and boulders: these islets being either scantily covered by coarse species of sugar, or tree jungle, or grass and tree jungle. The *Karam* is a considerable stream, consisting of a succession of rapids; its banks are clothed with very heavy tree jungle, among which the *simul**, *údalt*†, and a species of alder occupy conspicuous places. On the second day of its ascent we reached the Kamptee village *Palampan*, situated about a mile inland in a southerly direction; it is small and of no consequence, although the Rája is of high rank.

* *Bombax heptaphyllum*.

† *Sterculia* sp.

At this village my attention was first directed to a very valuable native dye, the *room* of the Assamese; with this dye all the deep blue cloths so much used by the Kampteas and Singphos are prepared. What is more curious, it belongs to a family (*Acanthacea*), the constituents of which are generally devoid of all valuable properties—it is a species of *Ruellia*, and is a plant highly worthy of attention. Leaving the boats, I proceeded up the *Karam*, the general direction of which is about E. S. E., and after a tedious march of five hours over small boulders, reached the first *Mishmee* village on the route. This village is called *Jingsha*, deriving its name, as appears to be always the case, from the Gam: it is about six miles from the foot of the hills—it is small, the number of houses not exceeding ten, and possesses apparently very few khets. The Gam is a man of inferior note. After a halt of two days to enable my people to bring up the provisions, &c., I left for *Brahma-kúnd*, which, from Captain WILCOX's description, I imagined to be the usual route to the interior. *Brahma-kúnd* lies to the E. N. E. of *Jingsha*, from which place it is distant by the path, which is very circuitous, about twelve miles. The route at first follows another bed of the *Karam* to the S. W., thence ascending the *Daí Púnee* to the eastward, thence diverging to the north through a heavy tree jungle, and after traversing this for about an hour ending at the *kúnd*, to which place the descent is steep, but short. Of this celebrated place much has been said, but no description at all answers to it, as it exists now. The scenery is bold, the hills on either side of the river being very steep but of no great height, and the *kúnd*, or reservoir itself is totally lost in the contemplation of the immensely deep bed of the river and the gigantic rocks visible in every direction. The extreme width of the bed of the river is certainly upwards of one hundred yards, but of this only the left half is occupied by the stream. The *kúnd* is contemptible, and unless the attention were especially directed to it, would quite escape observation. The *Deo Púnee* is a paltry attempt at a waterfall. The course of the river is slow and sufficiently tranquil, but to the eastward there is a violent rapid ending about sixty yards from the *kúnd* itself. This reservoir owes its existence to the projection of two rocks into the *Lohit*; at this season it contains but little water. The fuqeer's rock is a huge mass perforated near its summit; its extreme apex is accessible, but with difficulty; it does not represent Gothic spires, this appearance, so far as I know, being limited to shell-limestone. At this romantic spot I staid three days, paying particular attention to the vegetation of the place, which presents some curious features, of which the most

remarkable is the existence of a species of maple and one of rue: the former being an inhabitant of *Nipal*, the latter of considerable elevations on the Khasiya ranges. I was met here by TAPAN GAM, the chief of the *kánd*, who claims all the offerings invariably made to the deity by every native visitor of whatever rank or religion he may be.

After examining the adjoining hills, over which the route pursued by Lieutenant WILCOX lay, I was convinced of the impracticability of proceeding, at least with the usual description of Assamese coolies. I was therefore compelled to retrace my steps to *Jingsha*, having previously arranged with TAPAN GAM for guides to shew me the usual route. At *Jingsha* I was delayed for several days in bringing up rice, which had been kindly forwarded from *Sadiyá* by Lieutenant MILLAR, and without which I knew it would be impossible to visit the interior. From *Jingsha* I proceeded up the *Karam* in an easterly direction, diverging thence up the *Kussing Pánee* in a N. E. direction, thence skirting the foot of the hills, through remarkably heavy bamboo jungle. After a long march we descended a low hill to the *Lai Pánee*, but at a higher point than any previously visited. The following day I commenced the ascent, passing during the day a small Mishmee village without a name, and halting on the slope of a hill in heavy tree jungle. Commencing our march early next morning, we ascended and descended several considerable hills, and at noon reached *Deeling*, the *Dilling* of Captain WILCOX. This is a small village consisting of a few houses, scattered in various directions, and opposite to it on the great mountain *Thumathaya* is another called *Yeu*: there is about this place a good deal of cultivation. It was here that I came upon the route previously followed by Captain WILCOX. This I followed as far as GHALOOM's: it is correctly described in that officer's memoir on *Assam* and the neighbouring countries. Our halts were as follows:—on the third day the bed of the *Lohit*; on the fourth at the mouth of the *Lung*; on the fifth at GHALOOM's, whose village has been removed to the banks of the *Lohit*, and at a distance of about one bour's march in advance from the old site. From GHALOOM's I proceeded to KHOSHA's, whose village is on the north bank of the *Lohit*. I crossed the river, which is here about forty yards wide, and as usual deep and tolerably rapid, on a bamboo raft, no one but the Mishmees venturing by the suspension canes, which are here stretched over a space of about eighty yards, and at a formidable height from the stream. From KHOSHA's I proceeded to PRIMSONG's, whose village is at a much higher elevation than any of the others: but PRIMSONG was unfortunately absent. This was the extreme point to which I was enabled

to proceed, and after waiting three days for the arrival of the chief, I returned to KHOSHA's, where I met with PRIMSONG, who had just returned from a visit to TRUSONG, a chief whose village is far in the interior.

I had thus become acquainted with all the influential chiefs near our frontier, and by all I was received in a friendly and hospitable manner. In accordance with my original intentions, my attention was in the first place directed towards ascertaining whether the tea exists in this direction or not, and, as I have already informed you, I have every reason to think that the plant is unknown on these hills. From what I have seen of the tea on the plains, I am disposed to believe that the comparative want of soil, due to the great inclination of all the eminences, is an insuperable objection to its existence.

As I before observed to you, during my stay at *Jingsha* my curiosity had been excited by reports of an incursion of a considerable force of Lamas into the Mishmee country. It hence became, having once established a footing in the country, a matter of paramount importance to proceed farther into the interior, and, if possible, to effect a junction with these highly interesting people; but all my attempts to gain this point proved completely futile; no bribes, no promises would induce any of the chiefs to give me guides, even to the first Mishmee village belonging to the Meyhoo tribe. I was hence compelled to content myself for the present, with obtaining as much information as possible relative to the above report, and I at length succeeded in gaining the following certainly rather meagre account.

The quarrel, as usual, originated about a marriage settlement between two chiefs of the Meyhoo and Taen tribes: it soon ended in both parties coming to blows. The Meyhoo chief, ROOLING, to enable him at once to overpower his enemies, and to strike at once at the root of their power, called in the assistance of the Lamas. From this country a force of seventy men armed with matchlocks made an invasion, and, as was to be expected, the Taen Mishmees were beaten at every point and lost about twenty men. The affair seem to have come to a close about September last, when the Lamas returned to their own country. Where it occurred I could gain no precise information, but it must have been several days' journey in advance of the villages I visited.

It was owing to the unsettled state of the country, resulting from this feud, that I could gain no guides from the Digaroos, without whose assistance in this most difficult country, I need scarcely say, that all attempts to advance would have been made in vain. These people very plausibly said, if we give you guides, who is to protect us

from the vengeance of the Meyhoos when you are gone, and who is to insure us from a second invasion of the Lamas? Another thing to be considered is the influence even then exercised over the Mishmees near our boundaries by the Singphos connected with the Dupha Gam; but from the renewal of the intercourse with our frontier station, there is every reason for believing that this influence is ere this nearly destroyed.

I was, after various attempts, reluctantly obliged to give up the affair, although I am by no means certain that, had I known of the delay that would take place before I met Captain HANNAY, a longer sojourn in the hills would not have been attended with success. I returned by the same route, halting at *Deeling* to enable me to ascend the great mountain *Thumathaya*, on the top of which I passed one night, and the ascent of which in every respect amply repaid me for all difficulties incurred. On my return I visited TAPAN GAM's* village, where I met several Singphos, who were engaged in the late troubles on the side of the Dupha, and which is reported to be the favorite haunts of a famous Singpho dacoit, CHU'N YU'NG; thence I returned to *Jingsha*.

Nature of the country. The country traversed during the above journey consisted of a series of ascents and descents, as must always evidently be the case where the route follows the course of a considerable river; for difficulty it cannot well be surpassed, this again depending on the proximity of the route to the *Lohit*. The only comparatively easy portion is that between *Dat Pánee* and the place where we descended to the bed of the large river. The hills are invariably characterised by excessive steepness, and as the greater portion of the route winds round these eminences at some height above their bases, the marching is excessively fatiguing and difficult, to say nothing of its danger. In very many places a false step would be attended with fatal consequences; in one place in particular, upwards of an hour was consumed in traversing a sheer precipice at a height of at least one hundred feet above the foaming bed of the *Lohit*; the only support being derived from the roots and stumps of trees and shrubs, and the angular nature of the face of the rock, which is, I believe, grey carbonate of lime:

Paths. The paths are of the very worst imaginable description, always excessively narrow and overgrown by jungles in all directions. In very steep places the descent is assisted by hanging canes, which afford good support. No attempt is ever made at clearing them of

* This chief is not worthy of any encouragement. He would feel this the more, owing to the proximity of his village to our boundary and its easiness of access.

any obstruction: indeed the natives seem to think that the more difficult the paths the better, a greater security being thus obtained from foreign invasion. Better paths do exist, and there is one in particular on the north of the *Lohit*, which is that commonly used by the Mishmees when carrying cattle back from the plains to their homes. But it was my fortune to be shown the very worst, although I escaped the cliff above alluded to by following on my return another but very circuitous route. Up to GHALOOM's old site the hills are nearly entirely clothed with dense tree jungle, the points of some being covered with a coarse grass; thence every step towards the eastward is accompanied by a most material improvement, the hills presenting a very pleasing and varied surface, and being only clothed with tree jungle towards their bases. The extreme summits of the loftiest are naked and rugged.

Rivers and Torrents. The torrents which are passed between the foot of the hills and GHALOOM's are the *Tussoo* (*Dissú* of WILCOX), which separates *Thumathaya* from *Deeling*, the *Lung* and the *O*. Of these the *Lung* is the only one not fordable; the Mishmees cross it by suspension canes. I preferred constructing a rude bridge, which, as the torrent is divided by huge boulders, was neither a difficult nor a very tedious affair. The *Tid-ding*, which is of considerable size, is on the right bank of the river. The rills are frequent, especially towards the foot of the hills. I saw only one waterfall of any magnitude near the *Tussoo*: the body of water is not great, but the height of the fall is certainly one hundred feet. The *Lohit* itself beyond the *Lung* is of no great size, the average breadth of the stream at that season being from forty to fifty yards. At GHALOOM's its depth did not appear to exceed thirty feet. It is a curious fact, its temperature is lower than that of any of its tributaries. Although I have not seen the *Dibong*, judging from the comparatively small size of the *Lohit*, the probability is much in favor of the former carrying off the waters of the *Tsan-poo*.—PRIMSONG indeed informed me that the *Lohit* above the *Ghaloom Pánee* (*Ghaloom Thee* of WILCOX) is an insignificant mountain stream.

Altitude of Mountains. Of the height of the various ridges surmounted I can give no idea: the only thermometer I had was unfortunately broken before my arrival at the *kúnd*. The highest I visited was *Lamplang-thaya*; the next in height *Thumathaya*: on both these snow occasionally collects during the cold months. The western face of the latter is completely bare towards its summit, the eastern being covered with tree jungle. Of the former, the upper third is completely naked; and two efforts to complete its ascent were fruitless.

Geology. Of the geology of these hills I am unfortunately incompetent to judge; nor was I ever enabled to make a satisfactory collection, owing to the impossibility of procuring additional carriage.

Zoology. The subjects presented by the animal kingdom are certainly not extensive either in number of species or of individuals. I observed no wild quadrupeds except monkeys and an occasional squirrel; no tigers exist, but bears are represented as tolerably numerous. The number of birds which I succeeded in procuring barely amounted to species.

Botany. Of the botany it is not my intention here to give an extended account. It is sufficient to state that it appears to have similar features with other portions of the *Sub-Himalayan* ranges. I did not reach the region of fir trees, but I could plainly distinguish by the telescope the existence of very extensive forests on the loftier ranges to the eastward. The families that have the most numerous representatives are *Compositæ*, *Urticæ*, *Balsamineæ*, *Cyathandiaceæ*, *Acanthaceæ*, *Gramineæ* and *Filices*. The most interesting, chiefly from the indicating elevation, or from their being usually associated with climates similar to that of northern Europe, are *Ranunculaceæ*, including that valuable drug the *Mishmee-Teeta*, and the celebrated poison Bee. *Fumareaceæ*, *Violaciæ*, *Camelliaceæ*, *Hamamelidiæ*, including the *Bucklandia* and *Sedgwickia*, *Gentianeæ*, *Vacciniaceæ*, *Campanulaceæ*, *Thymaleæ*, *Juglandeæ*, *Cupuliferæ*. The most unique plants is a new genus of *Raffleseacea*, like its gigantic neighbour of the Malayan Archipelago, a *parasite*, on the root of a species of vine.

The natives of this portion of the range are divided into two tribes, Taeen or Digaroo and Meyhoo, these last tracing their descent from the *Dibong* Mishmees who are always known by the term crop-haired. The Meyhoo, however, like the Taeens, preserve their hair, wearing it generally tied in a knot on the crown of their head. The appearance of both tribes is the same, but the language of the Meyhoos is very distinct. They are perhaps the more powerful of the two; but their most influential chiefs reside at a considerable distance from the lower ranges. The only Meyhoos I met with are those at *Deeling*, *Yeu*, a small village opposite *Deeling* but at a much higher elevation, and *Tapan*. I need scarcely add that it was owing to the opposition of this tribe that Captain Wilcox failed in reaching *Lama*. The Digaroos are ruled by three influential chiefs, who are brothers, DRISONG, KHOSHHA, and GHALOOM: of these, DRISONG is the eldest and the most powerful, but he resides far in the interior. PRIMSONG is from a distant stock; and as the three brothers mentioned above are

all passed the prime of life, there is but little doubt that he will soon become by far the most influential chief of his tribe. Both tribes appear to intermarry. The Mishmees are a small, active, hardy race, with the Tartar cast of features; they are excessively dirty, and have not the reputation of being honest, although, so far as I know, they are belied in this respect. Like other hill people, they are famous for the muscular development of their legs:—in this last point the women have generally the inferiority. They have no written language;—their clothing is inferior; it is, however, made of cotton, and is of their own manufacture;—that of the men consists of a mere jacket and an apology for a *dhoti*,—that of the women is more copious, and at any rate quite decent: they are very fond of ornaments, especially beads, the quantities of which they wear is very often quite astonishing. They appear to me certainly superior to the A'vors, of whom, however, I have seen but few. Both sexes drink liquor, but they did not seem to me to be so addicted to it as is generally the case with hill tribes:—their usual drink is a fermented liquor made from rice called *month*: this, however, is far inferior to that of the Singphos, which is really a pleasant drink.

Religion. Of their religion I could get no satisfactory information:—every thing is ascribed to supernatural agency. Their invocations to their deity are frequent, and seem generally to be made with the view of filling their own stomachs with animal food. They live in a very promiscuous manner, one hundred being occasionally accommodated in a single house. Their laws appear to be simple,—all grave crimes being judged by an assembly of Gams, who are on such occasions summoned from considerable distances. All crimes, including murder, are punished by fines; but if the amount is not forthcoming, the offender is cut up by the company assembled. But the crime of adultery, provided it be committed against the consent of the husband, is punished by death; and this severity may perhaps be necessary if we take into account the way in which they live.

The men always go armed with knives, Lama swords, or Singpho *dhaos* and lances; and most of them carry cross-bows—the arrows for these are short, made of bamboo, and on all serious occasions are invariably poisoned with *bee*. When on fighting expeditions, they use shields, made of leather, which are covered towards the centre with the quills of the porcupine. Their lances are made use only for thrusting: the shafts are made either from the wood of the lawn (*Caryota ureas*) or that of another species of palma *juce*—they are tipped with an iron spike, and are of great use in the ascent of hills.

The lance heads are of their own manufacture and of very soft iron. They have latterly become acquainted with fire-arms, and the chiefs have mostly each a firelock of *Lama* construction.

Their implements of husbandry are very few and rude. They have no metal utensils of their own manufacture,—all their cooking being carried on in square capacious stone vessels, which answer their purpose very well. The population is certainly scanty, and may be estimated as follows :—

Jingsha,	50
Tapan,	80
Deeling and Yeu,	80
Ghalooms,	80
Khasha,	100
Primsong,	70
	<hr/>
	460

This must be considered as a rough estimate, and probably is considerably exaggerated.

The number of villages among which the above population is distributed is seven, but it must be remembered that there are two other villages, namely, *Meerisao* and *Rulings*, close to the *Khashas*. By far the greater number of villages appear to be located near the banks of the *Lohit*; I saw only one situated on the *Leeng*; while on the summits of *Thumathaya*, the villages *Jingsha*, *Tapan*, *Deeling* and *Yeu* consist of several houses, none, however, exceeding ten in number; and *GHALOOM'S*, *KHASHA'S* and *PRIMSONG'S* consist each of a single house. The houses in the former case resemble a good deal those of the *Singphos*, and are of variable size; in the latter case the house is of enormous length, this depending on the rank of the possessor, and capable of accommodating from eighty to one hundred and sixty persons,—all are built on *machauns*, constructed almost entirely with bamboo, divided into compartments and thatched with the leaf of a marontaceous plant (arrow-root family) likewise found in *Assam*; this being again covered, at least in some instances, with the leaves of a species of *ratan*. The leaf of the former answers its purpose admirably both as to neatness and durability, and forms an excellent protection against the rain. *KHASHA'S* house is certainly one hundred and sixty feet in length; it is divided into twenty apartments, all of which open into a passage: generally it would appear on the right side of the house as one enters, along which the skulls and jawbones of the various cattle killed during the possessor's life time are arranged. In each apartment there is a square fire-place, consisting merely of earth,

about which the bamboos are cut away. As no exit for the smoke is allowed, the air of the interior is dense and oppressive, and often exceedingly painful to the eyes.

Domestic animals. Their live-stock consist chiefly of hogs, *mathoons*, a noble animal intermediate between the bull and buffalo, and fowls. Of these the hogs are the most common—they are easily procurable; but they are not at all disposed to part with the fowls, which they say is the favorite food of the deity. I was hence frequently reduced to eat pork, which seemed to me, no doubt, on account of its vile feeding, very unwholesome. On my arrival at each village a hog was killed as a matter of course, of which a portion was presented to me, and a portion to my people. In one case only a young mathoon was killed; in all these cases, the flesh is immediately cut up and devoured as soon as possible. Their cooking is very rude, chiefly consisting of minces. Chowrie-tailed cows are only to be met with farther in the interior.

Their dogs are of the ordinary pariah kind. Cats are uncommon.

Among the skulls ranged in their houses, those of several other kinds of cattle occur, including the cows of the plains, and the buffalo; the remainder are procured entirely from *Lama*.

Cultivation. Their cultivation is scanty, apparently not sufficient to supply even their wants, and carried on in a very rude way. The most favorable places are of course selected, either on the slopes of the hills or on the occasionally more level patches, and joining the *Lohit*. The soil in almost all cases consists of a thin superstratum of vegetable mould. Some of the villages are in possession of a good sort of hill rice, but the chief cultivation is of *bobasá**, *goomdan†* or Indian corn, *khonee‡* and two or three still inferior grains. The villages situated at low elevations produce excellent yams and *aloos* of several kinds. They are unacquainted with wheat, barley, &c.; nor have they even taken the trouble to obtain potatoes. The capability of the country up to the point to which I searched, is not great, but thence the landscape is at once sufficient to convince one that the improvement is rapid as one proceeds to the eastward.

Of *kaneé* a small quantity is cultivated, chiefly however for sale to the Singphos, although many of the natives are great opium eaters. They cultivate a sufficient quantity of cotton for the manufacture of their own clothing, but it seems to be of inferior quality. Tobacco is in great request, still it does not seem to be regularly cultivated. Both sexes, young and old, are determined smokers; their pipes are

* Elentine caracana.

† Tea woy.

‡ Davae sp.

chiefly of Singpho manufacture; the poor classes contenting themselves with those made from bamboo.

Granaries. I should have mentioned that the produce of their fields is kept in small granaries, at some distance from their houses: and it is a regulation calculated to prevent quarrels, that each wife, (for they tolerate polygamy,) has her distinct granary. Their bridges have been well described by Captain WILCOX;—the passage of that at GHALOOM's which is full seventy yards in length, occupying from two to two and half minutes. The articles in the greatest request among them are salt, woollen clothing, printed cottons, and glass beads of various colors. Of the existence of salt, within their own boundaries they are unaware: generally they have none. Occasionally they procure Lama rock-salt, which is (in bulk) of a reddish color, from being mixed up with a red earthy substance somewhat aromatic. For these they exchange cloths of their own making, and their three staple articles, *mishmee-teeta*, *bee*, and *geitheoon*, which are, in fact, at present the only valuable known products of the country.

With *Lama* they carry on an annual trade, which apparently takes place on the borders of either country. In this case *mishmee-teeta*, is the staple article of the Mishmees, and for it they obtain *dhaos* or straight long swords of excellent metal and often of great length; copper pots of strong, but rough make, flints and steel, or rather steel alone, which are really very neat and good; warm woollen caps, coarse loose parti-colored woollen cloths, huge glass beads, generally white or blue, various kind of cattle, in which *Lama* is represented as abounding, and salts. I cannot say whether the Lamas furnish flints with the steel implements for striking light; the stone generally used for this purpose by the Mishmees is the nodular production from *Thumathaya*,—and this, although rather frangible, answers its purpose very well; with the Singphos they barter elephant's teeth, these animals being found in the lower ranges, for slaves, dhaws, and buffaloes.

With the Khamtees they appear to have little trade, although there is a route to the proper country of this people along the *Ghaloom Púnee*, or *Ghaloom Thee* of WILCOX's chart; this route is, from the great height of the hills to be crossed, only available during the hot months.

With the inhabitants of the plains they carry on an annual trade, which is now renewed after an interruption of two years, exchanging cloths, Lama swords, spears, *mishmee-teeta*, *bee*, which is in very great request, and *gertheana* much esteemed by the natives for its peculiar and rather pleasant smell, for money (to which they begin to

attach great value), cloths, salt and beads : when a sufficient sum of money is procured, they lay it out in buffaloes and the country cattle.

Political relations. With reference to their political relations they were all—at least all those near our frontier—active supporters of the Dupha Gam, to whom they rendered very effectual assistance in the erection of stockades, although they declined fighting. Formerly the Rája of *Assam* exercised almost exclusive control over them, entirely, as it appears, from making their most influential chiefs trifling annual presents of one or two buffaloes. With our government their intercourse has, as I before mentioned, been entirely interrupted during the last two years ; at present, however, they appear inclined to pay all proper respect to the Assamese authorities. From the active assistance they rendered Dupha Gam, and in the second instance to put an impediment in the way of the trade of slaves, it is obviously of importance to keep them in this friendly state, and this would be best done by adopting the plan followed during the times of the Rájas of this portion of *Assam* ; and with this view I would beg to direct your attention to GHALOOM, KHOSHA, and PRIMSONG : of these three, KHOSHA is perhaps possessed of the greatest influence, but he is getting old and inactive. The same may be said of GHALOOM, his younger brother. The most active, ambitious, and enterprising man is certainly PRIMSONG, who is still young ; and as he evidently looks up to the possession of the chief authority among the Gams, any favor shewn to him would render him a steady friend. He is the only chief I saw who is in the habit of visiting *Lama*. It was from materials given by him that Captain WILCOX drew up that portion of his map which has reference to the course of the *Lohit*, and it is through him alone that we may look forward to becoming acquainted with the country of the Lamas. He is, in fact, far superior to all the rest in talents and information, and, as a proof of his activity, he has just returned from the *Hookum* territory, where he saw Captain HANNAY, and whither he had no doubt followed the Dupha Gam. So long indeed as the Mishmees are in relation with the Singphos, so long will there be a ready way in which to dispose of slaves by the Singphos, a people on whom no dependence is to be placed. At the period of my visit to KHASHA, I saw a slave who had been actually sold by Singphos residing within our territory, within the last six months. With the *Dibong* Mishmees they are, and always have been, engaged in a war of extermination. Of this tribe, both Mooghoos and Digaroos entertain the greatest fear : their inroads have caused the latter tribes to forsake their haunts on the *Digaroo* mountains, and I am told that

at this time none are to be found to the westward of the *Tid-ding*. With the Lamas, as I have before observed, they are at present at rupture; and protection might be promised them against the inroads of either people, such protection being chiefly limited to the loan of old muskets and ammunition. It is chiefly owing to their proximity to the Lamas, that the country of the Mishmees, as being the most feasible route thither in this direction, is worthy of attention. It is obvious from all accounts that the Lamas are a very superior race, and that they greatly resemble the Chinese. It would hence be highly desirable to open a trade between *Upper Assam* and *Lama*, and to this I really see no insurmountable objection. The great object to be first attained is personal communication with these people, and I have every reason to believe that through the influence and aid of PRIMSONG, who is well acquainted with them, that I should be able to accomplish this. On this subject, however, I have already addressed you officially.—PRIMSONG, in the event of the non-consent of the other chiefs, has promised to take the responsibility on himself, and as the route he has promised to take me leads across the termination of the *Himálayas*, and ends in some distance from the southern extremity of the valley, in which the inhabitants of this portion of *Lama* reside, he could necessarily act independently of them; almost all the Meyhoo chiefs, from whom the chief opposition is to be apprehended, being located along the *Lohit* to the westward of the junction of the *Ghaloom Pánee*. Having once gained access to the valley, a return could be effected along the banks of the *Lohit*, so as to materially increase our knowledge of that river. From my knowledge of the Mishmees I am confident that the slightest care would ensure me from any attempts at treachery. Open hostilities they would never attempt, and as there would be no crossing of any considerable river, no attempts could be made, as they, the Meyhoos, appear to have intended in Captain WILCOX's instance, on the party when subdivided. The hasty retreat of this officer has been attended with unfortunate results in increasing the fear which the Digaroos entertain for the Meyhoos.

With reference to my making the attempt, I can only say that sixty maunds of rice are already lodged within the hills, and my orders are only necessary to cause its transportation to the villages of KHOSHA, GHALOOM, and PRIMSONG. Thus one great obstacle in all hill expeditions is already removed. PRIMSONG has engaged to provide me with men for the transports of my carriage and the necessary presents; thus I shall run but little risk from detention owing to the sickness or laziness of coolies. In short, the only thing likely to interrupt my

progress will be sickness; but having once reached PRIMSONG's, safety would be perhaps insured. I speak here in allusion to the season, the route being, from the great height of the mountains to be crossed, only practicable during the rains. I shall close this portion of my letter with a few remarks on the Lamas, for which I am indebted to PRIMSONG. He describes them as resembling the Chinese, whose peculiar manner of wearing their hair they adopt; the country is very populous, the houses well built, and the people are well supplied with grain, the staple one being rice. They are of a large stature, well clothed, wearing Chinese trousers and shoes, navigating their rivers by means of boats, and using horses, of which they possess three varieties, as beasts of burthen. They possess in addition, no less than seven kinds of cattle. They distil ardent spirits, and their manufactures, which are numerous, are said to be very superior.

On my arrival at *Jingsha*, I determined on crossing the country towards *Beesa*, having heard that tea existed in this direction. Leaving *Jingsha*, I proceeded up the *Karan* to the east, thence diverging to the south along the now nearly dry bed of the *Kamptee*. During the march I passed one small Singpho village, and in the evening arrived at *Onsa*, the largest Singpho village I ever saw. On the following day I left for *Suttoon*, and after a march of three hours halted beyond *Suttoon* close to the head of the *Tenga Pánee*. From this, on the following day, I proceeded crossing the *Tenga Pánee*, the course of which I followed for some distance, thence diverging to the S. W. towards the *Minaboom* range through excessively heavy bamboo jungle. On reaching the *Muttock Pánee* I ascended its dry bed for some distance until we reached the hills. This range, along which I proceeded some distance, is entirely sandstone, and in no part exceeds five hundred feet in height; thence descended and arrived at the *Meerep Pánee*, in the bed of which we halted. The next day carried me after a long march to *Beesa*, the course first laying down the *Meerep Pánee*, thence to the westward and through a very low and uninteresting and nearly uninhabited country. We emerged from the jungle about a mile and a half above *Beesa*, to which place our course lay along the nearly dry bed of the formerly larger now small *Dihing*. This river, which up to last year drained a great portion of the Singpho country on this side of the *Patkaye* range, is now nearly dry, its waters having taken a new course into the *Kamroop*, and thence into the *Booree Dihing*. It is now only navigable for small boats as far as the *Degaloo Goham's* village, which is but a short distance from its mouth.

The valley occupied by the *Khakoo* Singphos, which I had thus crossed, is bounded to the N. E. by the *Mishmee* mountains, and to the S. W. by the *Mimboom* range ; it is of a triangular form, and not of any great extent : it is drained by the *Tenga Pánee*. The whole valley is comparatively high, and may be considered as a low table land : it is incomparably the finest part of our territory inhabited by Singphos, that I have yet seen : between *Itusa* and *Luttora*, I passed, although it was a short march, five large villages ; and whatever the case may be with the other portions of our Singpho territory, this valley is very populous and highly flourishing. *Luttora* is a village of no great size : formerly *Luttora Gam* was the chief of the whole valley, but his followers, since the affair of the *Dupha Gam*, have divided themselves between *Itusa* and *Ittanshantan* Gams who are friendly to our Government.

From *Itusa Gam* I met great attention ; from *Luttora Gam*, until lately an avowed enemy to our Government, I received a visit, being the first he ever paid to any officer. He made the usual professions of submission ; but on my telling him that he should send in his submission to the officers at *Sadiyá*, he replied very quietly, that he must first communicate with the *Dupha Gam*. (Latterly I understand that he has sent his submission in to the Political Agent.) He was attended with a considerable number of men armed with lances and *dhaos*. He is a large, ruffianly-looking man, nearly blind, and for a Singpho very dirty. He was attended with an adherent of the *Dupha Gam*, who had just returned from *Hookum*. This man descanted on the general satisfaction given to the chiefs about *Hookum* by the presents of Captain HANNAY, and he said that all the chiefs had agreed to bury the remembrance of all former feuds in oblivion.

The chief cultivation of the valley is that of *ahoo dhan*, the fields of which are numerous and extensive.

The manners of the *Khakhoos* are the same as those of the other Singphos ; they are represented, however, as excelling these in treachery and cruelty. I met with no opposition on the journey, although I was attended by only sixteen *Donaniers* ; and although, as I have since ascertained, my adoption of this route caused great offence to the chiefs, one of whom sent a letter of remonstrance to the officers at *Sadiyá*. They have a great number of Assamese slaves, and there is but little doubt that the practice of slave-selling still exists among them. In fact a *Donanier* from *Chykwás* was actually obliged to place himself under my protection. None of the villages are stockaded. *Luttora* is on a strong site, being built on a steep eminence nearly surrounded by two

small streams; and as the ascent is steep, although not great, it is difficult of access, and might be well defended.

I gained no clue to the actual existence of the tea, although the yellow soil was not unfrequent towards the head of the *Tenga Pánee*. The *Minaboom* range, as I have above observed, is of no considerable height; it is covered with tree jungle, among which occurs a species of *dammai*, *amagnolea*, and one or two species of oak.

On arriving at *Bessa* I heard that Mr. BRUCE was at *Fingree*, and as that gentleman had previously expressed a wish that I should give my opinion on his mode of tea culture, I immediately determined on proceeding thither: with this view I left for *Rapoo*, which I reached in two ordinary marches. There visited the tea, and then left for *Rapoodoo*. Here also I visited the tea, which is abundant, appearing to me the best of that produced in the Singpho territory;—the soil is precisely the same, in all its external characters, as that of the other tea localities.

The tea plant being certainly adapted to some degree of shade, the free exposure to the sun seems wrong in principle, evidently producing a degree of coarseness in the leaves, totally incompatible, I presume, with the production of fine flavored teas.

From this place I proceeded through heavy jungle, uninhabited except by elephants, for two days, literally cutting my way where the tracks of the elephants were not available owing to their direction. Our course being determined by that of the *Dibora*, on the evening of the second day we arrived at *Choakree Ting* in the *Muttock* country, and halted on the *Rolea Pánee*. The third day, after a very long march of nearly twenty miles, carried me close to *Ranga gurrah*. On reaching this I found that Major WHITE was expected daily, but that Mr. BRUCE had already returned to *Sadiyá*.

I had the pleasure of accompanying Major WHITE three days after my arrival to *Tingree*, from which place we returned direct to *Sadiyá*, the march occupying three days.

The greater part of *Muttock* which I had thus an opportunity of seeing may be characterised as capable of producing tea, the soil being in almost every instance of that yellow color, hitherto found to be so characteristic of the tea localities. To this the only exceptions exist in the swampy ravines, which are occasionally of great extent. The better portions consist of rather high plains, covered with tall coarse grasses, and intersected here and there with narrow strips of jungle. It may be considered as a comparatively open country;—the villages are numerous, and the people satisfied. Altogether *Muttock*

may be considered as a well-governed flourishing district. But on this point I need not detain you, as the nature of the district is sufficiently well known.

The villages passed between *Beesa* and *Muttock* are few; the first is a small temporary village occupied by Nagas, about ten miles from *Beesa*. The next is *Dhompson*, a large Singpho village, half way between the Naga village, and *Rapoo*, *Rusoo*; and, lastly, *Rupádoo*. Between this and *Choakrí Ting* no villages occur.

II.—*Corrected Estimate of the risk of life to Civil Servants of the Bengal Presidency.* By H. T. PRINSEP, Esq. Sec. to Govt. &c.

In the number of this Journal for July, 1832, some Tables were published showing the risk of life amongst Civil Servants on the Bengal Establishment, and in a short article the principles were explained upon which the tables had been framed. The method adopted in that article for computing the risks of life in the Civil Service of the Bengal Presidency has met the entire approbation of the most able actuaries in England, and the tables have not only been adopted as affording the best estimate forthcoming of the chances of life amongst persons in good circumstances in the climate of India, but attempts have likewise been made to apply the same method of computation to other services. Amongst others, Mr. CURNIN has, we understand, successfully computed tables framed on the same principles for the Military Services of all the three Presidencies of India, from the year 1765 to the present date,—a work of immense labour, the results of which we have seen in abstract, and lament that the publication of them has been so long delayed. As our Civil Service tables have thus acquired an importance, as well from the use made of them by insurance offices, as from the application of the principle to the construction of other tables, we have deemed it necessary, now that another lustrum of five years has passed since they were framed, to republish them, completed to the close of 1836, and to draw attention a second time to the method adopted in their construction. We will not conceal that a principal motive with us for taking this trouble is that we have discovered some errors in the Tables of 1832, and therefore are anxious to supersede it for practical use by supplying one more accurate. We are glad also to avail ourselves of the opportunity to point the attention of public officers and persons of intelligence at other Presidencies to the expediency of keeping registers and framing similar tables for the different services with which they may be con-

nected. In a very valuable paper drawn up by Mr. GRIFFITH DAVIES for the Bombay Civil Fund, a form of register is given, which, if duly kept, will afford the means of constructing accurate tables for any purposes framed precisely upon our principle, and this table may be adopted for a regiment or for any number of persons circumstanced alike—that is, when in a condition to yield a fair average of casualties, just as well as for a service constituted like the Civil Services of the different Presidencies. The only thing to be attended to is, that in like manner as a separate page in the service registers ought to be set apart for the nominations of Civil Servants for each year, because, for facility of computation, we assume them to be of persons of the same average age, so a separate page must be assigned to persons of the same age when the register is formed for the purpose of obtaining the risks of life amongst persons promiscuously selected, and not of uniform or nearly corresponding ages.

As it is of importance that this should be well understood, and because we wish to inculcate the expediency of framing tables of the same kind not only for his Majesty's and for the Native regiments, but likewise for the natives of cities and towns in different parts of India, we shall devote a few words to a little further explanation of the registers we recommend to be kept. The following is the form into which any number of names upon which it is desired to obtain life results of any kind may be entered, taking care only, as before pointed out, that those entered in the same page are always of the same age at the time of first registry.

Page 14.

Age 23, 1st year. 2nd. 3rd. 4th. 5th. 6th. 7th. 8th. 9th. 10th. &c.

A.	..	1	1	1	1	1	1*				
B.	..	1	1	1	1	1	$\frac{1}{2}$ died.				
C.	..	1	1	1	1	1 mar.	1	1 one son.	1	1	1
D.	..	1	1	$\frac{1}{2}$ died.							
		4	4	$3\frac{1}{2}$	3	3	$2\frac{1}{2}$	1	1	1	1

Page 16.											
Age 25.											
E.	..	1	1	$\frac{1}{2}$ died.							
F.	..	1	1	1	1	$\frac{3}{4}$ †					
G.	..	1	1	1	1	1	1	1	1	1	1
H.	..	1	1	1	1	1	1	1	1	1	1
		4	4	$3\frac{1}{2}$	3	$2\frac{1}{2}$	2	2	2	2	2

Now if one hundred names of soldiers were entered in the first column as having come into the country at the age of 23, though every one of them came, perhaps in a different year, still the register for as many years as it may extend in respect to these persons,

* Discharged.

† Returned to England.

giving in each the fact of the individual having outlived that year or not, or any other circumstance or event, must afford the means of computing the different accidents of life for every age that may be reached by the persons so registered, and the results of one page may be combined with those of any other by adding the sum at the bottom of the page to the proper column with reference to age of such other page, and by taking out of the whole the number of deaths or of marriages or of the births of children, male or female, or of any other accident of life that may be recorded in the column to compare with the sum of the lives of the age in both pages or of as many pages as may be brought into the computation.

We presume that every insurance office keeps registers framed upon this principle, but we wish to see them extended to the Army and likewise to some thousands of natives in towns and in the interior, with a view to obtaining the materials for computing the risks and accidents of life amongst these classes at different ages, in respect to which we are at present without any materials for framing a table or estimate of any kind.

The tables given in Captain HENDERSON'S article upon the subject of the value of life in India, published in the last volume of the *Researches of the Asiatic Society*, though framed with great labour, are defective in this point*. They afford general averages of the value of life amongst certain classes, but not of the value of life at each year of age, which is a most essential circumstance; and for insurance offices or for institutions which deal in annuities, the risks with reference to age are the main and most important, if not the only, matter for consideration.

It is to be observed that it will not be possible to frame registers retrospectively for any class of persons, unless from peculiar circumstances a given number of names with the age of each individual can be entered for any specific past date, and these can be followed out in all their circumstances to the date of the formation of the registers. This is the principle upon which the previous and present tables have been framed for the Bengal Civil Service, and upon which similar tables have been made for the Army. The nominations of each year to the different services being fixed and known, and the

* Capt. DEHAVILAND'S tables for the Madras army are an exception to this remark, as they are framed by years of service on our principle, but the results of the first years of the series give ratios of deaths for those years which cast a doubt on the accuracy of the whole table. Mr. GORDON'S army table is of too old a date to be useful.

power existing of tracing almost every nominee, the registers have been made up for past years as completely and accurately as if the nominees of the present year were to be followed prospectively through their career of service to the time of their deaths or retirements. The same principle may perhaps be adopted in framing regimental registers retrospectively for privates and non-commissioned officers, because each individual can similarly be traced, and his age at the time of enlistment or of arrival in India will be on the regimental rolls; but no materials will be any where forthcoming from which to do the same for any class of natives, unless it be for the tenants of the different jails during the period of their confinement for debt or under criminal sentences.

Having premised the above remarks on the general applicability of the method of computation adopted for ascertainment of the risks of life amongst Bengal Civil Servants, it remains to give the amended table, framed from the registers prepared in the Secretary's office at Calcutta for the Bengal Service from 1790 to 1836. The number of individuals of the class whose names are registered, and who have given to our table a first year of life, is now very nearly 1000*, and the average of the first five years is consequently framed on a total of 4525 lives. To the end of the 20th year the number of annual lives now exceeds 300, and the five years' averages are upon numbers exceeding two thousand; the yearly numbers diminish to 100 at the end of the 30th year, only affording for the five years' average of that period of life as many as 660 lives. For the succeeding five years the average is reduced to actual casualties upon 299 lives, and after that the numbers are too small to afford any data that can be relied upon.

To the corrected estimate now given of the risks of life in the Bengal Civil Service, we have added a column for retirements, in order that the curious in Europe may build ingenious speculations thereupon. It is mortifying to observe that the total number of these

* The registered nominations are 1003, but this includes the nominees of 1836 who have not yet given us a first year of life. The following test of the accuracy of our table may be satisfactory.

Nominees from 1790 to 31st Dec. 1836,	1003
Deaths of table,	335
Deaths in year of nomination, not included in the table, ..	8
Retirements as in table,	177
	<hr/> 520

Remains on the Civil List 1st January, 1837, deducting the
China Servants,

483

does not equal one half of the deaths, but this statement we would remark is not framed to show the chance an individual entering the Bengal Civil Service has of retiring with a fortune. For the exhibition of that result a very different table must be prepared, framed on the principle of following out the nominations of those particular years of which all the nominees are expended by death or retirement. There are four years in this predicament, the results of which give the following ratios of deaths to retirements.

Nominations.	Deaths.		Retirements.	
	Before 20th year.	In or after 20th year.	Before 20th year.	In or after 20th year.
1790 19	8	3	2	6
1792 18	5	2	2	9
1794 26	12	5	5	4
1798 32	8	8	6	10
95	33	18	15	29
	51		44	

From this it would appear that out of ninety-five Bengal nominations the deaths are 51, or more than half; the retirements are 44, of which 15 occurring before the 20th year cannot be considered as retirements with fortunes made in India. Twenty-nine, however, out of 95, or somewhat less than one-third, is the proportion of retirements with fortune afforded by the results of these four years.

To return, however, to the life tables: we have not thought it worth while to publish on this occasion the extended tables in which the results of each individual year have been combined for the formation of the corrected general result now exhibited. These exist together with elaborate registers with the name of every Bengal Civil Servant inscribed ready to be referred to by any person desirous of looking further into the detail. We explained fully in the article of July, 1832, the method we had followed in extracting and combining these results, and it would be an unnecessary repetition therefore to follow the process of computation again through each of the stages. We conclude with expressing our desire that the present table may supercede altogether Table III. of the article of July, 1832, and we vouch for its superior and, we believe, perfect accuracy. The quinquennial percentage is carried only to the thirteenth year of residence or 49th of life. The results of the remaining years are gathered into our percentage for the whole.

Amended Table for shewing the risks of life in the Bengal Civil Service, founded on the actual casualties upon the nominations made to that Service from 1790 to 1836, the first year being computed from the 1st January, after the year of nomination.

Year of Service.	Age.	Number of Servants.		Deaths.	Total deaths in 5 years.	Percentage rate of deaths in 10,000.	Retirements actual.
1	20	4525	975	19	90	199	2
2	21		933½	22			3
3	22		906½	18			7
4	23		874½	19			5
5	24		835½	12			7
6	25	3454½	790½	10	72	208	7
7	26		754	17			4
8	27		694½	17			3
9	28		638	20			4
10	29		577½	8			3
11	30	2469½	545	6	41	166	2
12	31		519½	14			1
13	32		489	8			2
14	33		468	5			6
15	34		448	8			2
16	35	1879	424	6	44	234	6
17	36		403	9			2
18	37		376½	11			7
19	38		351	10			2
20	39		324½	8			7
21	40	1214½	293½	11	43	354	9
22	41		270	10			6
23	42		239	10			6
24	43		216	5			2
25	44		196	7			24	363	10
26	45	167½	7	9			
27	46	148	7	8			
28	47	129	3	8			
29	48	114½	4	1			
30	49	299	101½	3	21	486	5
31	50		88½	4			9
32	51		67½	1			5
33	52		57½	3			5
34	53		47½	6			1
35	54		38	2	21		0
				16			
36	55	109	32½	1	21	486	1
37	56		24½	1			5
38	57		19½	1			1
39	58		17½	0			1
40	59		15	0			0
				3	2		
41	60	25	9	2			
42	61		5	0			0
43	62		5	0			0
44	63		3	0			0
45	64		3	1			0

III.—*A Grammar of the Sindhi language, dedicated to the Right Honorable Sir ROBERT GRANT, Governor of Bombay. By W. H. WATHEN, Esq.*

It has been often paradoxically asserted, that those who have the most to do, contrive also to have the most leisure. The maxim will admit of as easy illustration in India as elsewhere, and may be supported by the highest examples, if it be conceded that the office of Secretary, or Minister, to an Indian Government requires a full allotment of time, an ample share of mental and mechanical exertion; for the Secretariat of either Presidency may be regarded as the fountain head of authorship on all Indian subjects, literary, political or historical. We need not recapitulate digests of law, Hindu and Musulmán; narratives of campaigns; schemes of fiscal administration, which may naturally enough emanate from such sources; but in pure literature, editorship of oriental publications, and translations therefrom, our Secretaries have ever occupied the foremost rank.

The present production of the Chief Secretary at Bombay is only a fresh instance of the talent and industry which in India is sure to win the reward of high appointment; but it is deserving of more than usual encomium, being a work of sheer labour and troublesome compilation, unsweetened with the associations of the annalist depicting events on which the fate of empires rested;—unenlivened by the ingenuities of antiquarian speculation or the romance of mythologic fiction. His has been a dry labour of utility, not of love, “to facilitate the intercourse of Europeans with the inhabitants of *Sindh* and the adventurous merchants of *Shikárpur* and *Múltán*.” It is a sequel to the famous Indus-navigation treaty;—one better calculated to effect a mutual understanding than the diplomatist’s negotiation with its uncompromising tariff! That it serves as a faithful interpreter, we have at this moment the best testimony to offer in a letter from an officer now travelling on the *Indus*, who says, “The Sindhi grammar does not contain a mistake, and I have never found myself at a loss, with a knowledge of its contents.” It may seem extraordinary that such a work should have been wholly compiled at a distance from, and by one who has, we believe, never visited, the country; but this is explained by the constant resort of the Sindhis to *Bombay*, where for the last 20 or 30 years at least 10,000 persons, the greater part of the population of *Tatta*, have become domiciled, speaking and writing their own tongue.

The Sindhi language is spoken “through the whole province of *Sindh*, and is said to be understood as far north as the territories of

BAHA'WAL KHÁN, the *Deráját*, and *Múltán*; it prevails westward in *Cutch-Gandava*, *Shál*, *Mastúng* and *Pishín*; eastward in *Cutch* it is spoken with some slight variations in formation and accent."

May we not venture to extend these boundaries, if not of the precise idiom, at least of the connected dialects of the *Sindhi* language?—Have not the words *Sindhi* and *Hindi* a common origin, the permutation of the *h* and *s* being nothing more in fact than the same difference of dialect which is preserved to this in the twin names of the river, *Sinde* and *Indus*? This at least is one of the most plausible theories of the origin of the name of India, and it is supported by innumerable examples of Zend and Persian words, in which the aspirate has taken the place of the Sanscrit sibilant.

The commercial celebrity of the Hindus in all ages attaches with undiminished force to the *Sindh* and *Márwár* merchant of the present day. They have their branch *kothís* not only throughout Upper India, but in *Calcutta*, *Bombay*, and wherever commerce is active. Theirs may be said to be the very language and archetype of hoondie circulation—the monopoly of banking business throughout the country. "The adventurous nations of *Shikárpur* and *Múltán* are spread in colonies throughout the whole of the extensive provinces of Central Asia, and form the chief medium for commercial transactions in those countries. They are to be found in *Russia*, at *Astrakhán*, through *Baluchistán* and *Seistán*, as well as at *Hirát*, and *Bokhára*: they possess political influence occasionally with the chiefs of those countries, from their command of capital, and their frequently taking farms of the revenues. Travellers starting from *Shikárpur* or *Múltán* (add *Bombay*, *Calcutta*, or *Benares*) might from them obtain bills of exchange on *Russia*, *Persia*, *Khorásán*, and Central Asia."

The neighbouring province of *Gujerat* is equally celebrated for its early commercial enterprize. We learn from HAMILTON, that the numerous tribes of *banyas*, named banyans by the English, are indigenous to this part of India, whence they have travelled to all parts of the continent, and formed settlements, "where their descendants continue to speak and write the *Gujeráti* tongue, which may be pronounced the grand mercantile language of Indian marts*."

For the foreign commerce of India the mouths of the *Indus* probably held long precedence to *Gujerat*, *Cambay*, and *Baroach*, the *Barugaza* of ARRIAN, which, more distant from Arabia and the Persian Gulph, would require a more advanced knowledge and boldness of navigation. Indeed it is a curious fact, that *Pátala*, the seaport on

* HAMILTON'S Hindostan, I. 612.

the *Indus*, still famous in ALEXANDER's time, should no longer be mentioned by the author of the *Periplus*, in whose time *Minagara* (*Mahá Nagar* ?) had become the capital of the country.

Pátala, in further support of our argument that *Sindh* was one focus of *Indian* civilization and colonization, is accounted by the Hindus the seat of government of the very founder of the Solar races, the Rajpúts of modern India ; Mr. CSOMA KÖRÖS extracts the following particulars regarding it from the Tibetan authorities.

“ *Potala* or *Potalaka* (Tib. གུ་རུ་ཨ་མིན་ *gru-hdsin*, or vulgo *kru-dsin*, boat-receiver, a haven or port) is the name of an ancient city at the mouth of the *Indus* river, the residence of IXWÁKU and his descendants of the *Suryavamsa*. Four young princes (who afterwards were surnamed SHA'KYA) being banished from that city by their father, took refuge in *Kosala* on the banks of the *Bhagirathí* river (in the modern province of *Rohilkhand*) and built the city of *Capilavastu*. The residence of the Dalai Láma at *Lassa* (built about the middle of the 12th century) is likewise called *Potala*, པོ་ཏ་ལ་, because CHEN-REZIK (པུན་པུ་ལ་ལ་པུ་ལ་) the patron of the Tibetans, the spiritual son of AMITÁBHA, is said to have resided at *Potala* in ancient India, and to have visited *Tibet* from that place*.”

The Sindhian origin of the Rajpút tribes derives no inconsiderable support from the evidence of the grammar and vocabulary before us. Here we find the mass of the language (excluding of course the Persian infusion) merely a little different in spelling and inflexion from the *Brijbháká* or pure *Hindí* of Upper India ; while there is a strong argument that the *Sindhi* is the elder of the two, in the more regular and elaborate inflexions of its cases and tenses ; and particularly in the complete conjugation of the auxiliary verbs *huwan* and *thiyan*, to be, of which, in the *Hindí*, we find but a single tense of the latter†, and a few tenses and a present and past participle of the former, extant. Although we cannot attempt to enter upon a critical examination of the grammar, which would indeed require a knowledge of Sanskrit, and perhaps Zend in addition to the vernacular, we feel it impossible to resist inserting these two verbs, as well for the important part they enact in modern dialects, as for the philological interest of these almost universal auxiliaries, particularly in regard to the pronominal affixes, elsewhere become nearly obsolete. The infinitives, like the Persian and Sanskrit, terminate in *an*.

* CSOMA'S MSS. See the Observations of M. BURNOURF in the preceding number, page 291.

† Or rather, none at all in the *Hindí* ; for *thá thé thí* belong to the *Hindu-sthání* or *Urdu*.

Conjugation of the Sindhi auxiliary verbs, to be.

Infinitive. <i>Ho-wan</i> (Sanskrit root भु.)		<i>T,hi-yan</i> (S. स्था, or स्थिति?)	
Indicative.	S. 1. <i>Awn áhiyan</i>	I am.	Caret
1st Present.	2. <i>Tun áhin</i> 3. <i>Hu áhe</i> P. 1. <i>Asin áhiyun</i> 2. <i>Ain áh yo</i> 3. <i>Hui áhín</i>		
2nd Present.	S. 1. <i>Huwn-t,ho</i> 2. <i>Huen-t,ho</i> 3. <i>Hoe-t,ho</i> P. 1. <i>Ho,un-thá</i> 2. <i>Ho,o-thá</i> 3. <i>Ho,wan-thá</i>	I am being.	<i>T,híyán t,ho</i> (fem. <i>thí</i>) <i>T,hiyen t,ho</i> <i>T,hiye t,ho</i> <i>T,híyun thá</i> <i>T,híyo thá</i> <i>T,híyan thá</i>
1st Imperfect.	S. 1. m. <i>Hos</i> fem. <i>Huís</i> 2. <i>Ho,en</i> <i>Hoen</i> 3. <i>Ho</i> <i>Hui</i> P. 1. <i>Hua sun</i> <i>Huyun sun</i> 2. <i>Hua</i> <i>Huyun</i> 3. <i>Hua</i> <i>Huyun</i>		m. <i>T,he thiyos</i> f. <i>T,he t,his</i> <i>T,he t,hiyen</i> <i>T,he t,hien</i> <i>T,he t,híyo</i> <i>T,he t,hí-i</i> <i>T,het,híya sun</i> <i>T,he thiyasun</i> <i>T,he t,híya</i> <i>T,he thiya</i> <i>T,he t,híya</i> <i>T,he thiyun</i>
2nd Imperfect.	1. <i>Hundo-hos, &c.</i> <i>Hundí huis</i> (m. Plural <i>Hundá</i>)		<i>T,hindo hos, &c.</i> <i>T,hindí husi</i> (masc. plur. <i>Thindá</i>)
Perfect.	Caret.	S. 1. <i>Thiyos</i> 2. <i>Thiyen</i> 3. <i>Thíyo</i> P. 1. <i>Thiya sun</i> 2. <i>Thiya</i> 3. <i>Thiya</i>	<i>Thís</i> <i>Thien</i> <i>Thíi</i> <i>Thii sun</i> <i>Thiya</i> <i>Thiyun</i>
Preterperfect.	Caret.	S. 1. <i>Thíyo áhiyán</i> 2. — <i>áhen</i> 3. — <i>áhe</i> P. 1. <i>Thíyá áhiyun</i> 2. — <i>áhiyo</i> 3. — <i>áhín</i>	<i>Thíí, &c.</i>
Pluperfect.	Caret.	S. 1. <i>T,hiyo hos</i> 2. — <i>hoen</i> 3. — <i>ho</i> P. 1. <i>Thíyá hasun</i> 2. — <i>huá</i> 3. — <i>huá</i>	<i>Thí huís</i> — <i>huen</i> — <i>huí</i> <i>Thíyun hasun</i> <i>Thíyá huá</i> <i>Thíyun huyun</i>
Future.	S. 1. <i>Hundos</i> 2. <i>Hunden</i> 3. <i>Hundo</i> P. 1. <i>Hundá sun</i> 2, 3. <i>Hundá</i> 3. <i>Hundá</i>		<i>T,hindos</i> <i>Thindis</i> <i>T,hinden</i> <i>Thinden</i> <i>T,hindo</i> <i>Thindí</i> <i>T,hinda sun</i> <i>Thindi sun</i> <i>T,hinda</i> <i>Thindiyun</i>
Subjunctive.	3. <i>Hundá</i>		<i>T'hinda</i>
Present.	S. 1. <i>Huán</i> 2. <i>Hoen</i> 3. <i>Hoe</i> P. 1. <i>Ho,un</i> 2. <i>Ho,o</i> 3. <i>Hon</i>	I may be.	m. <i>Thindo hundos</i> — — <i>den</i> — — <i>do</i> <i>Thinda hunda sun</i> — <i>hundá</i> — <i>hundá</i>
Perfect.	by adding <i>je, if,</i> to the indicative.	S. 1. <i>Thíyo hundos</i> 2. — <i>den &c.</i>	
Future.	I may, or will be.	S. 1. <i>Thíyan</i> 2. <i>Thiyen</i> 3. <i>Thíye</i>	P. 1. <i>Thíyun</i> 2. <i>Thíyo</i> 3. <i>Thíyan</i>
Imperative.	S. 2. <i>Ho-tun</i> P. 2. <i>Howo-ain</i>	S. 2. <i>Thi-tun</i> P. 2. <i>Thíyo-ain</i>	
Participle	present. <i>Hundar,</i> past. — perfect. —	being. — having been.	<i>T,hindar</i> <i>Thíyal</i> <i>Thí, Tháí, Thí kare</i> <i>Tháí kare</i>

In a similar manner is conjugated *Wanjan* (H. *jána*) to go, used as the auxiliary of the passive of other verbs: *wendo*, going—*wayo* (H. *gayá*) gone: *wanj-tun*, go thou.

The personal pronouns *awan*, *tún*, and their plurals *asin*, *tawin*, approach nearly to the Sanskrit *aham*, *twam*; *asmán*, *yusmán* (obj.): but for the third personal pronouns, as in *Hindí*, the demonstratives *he* and *hu* (H. *yih* and *wuh*) are employed, in lieu of the Sanskrit *seh*, *sá*, *tat*; in *bhāka*, sing. से, त; plur. ते, तिन. In the declensions of nouns we miss the *ka-ke-kí* to which TIMUR's soldiery professed such an abhorrence, but it is merely softened into *jo-jé-jí-já*. Of these, however, we find traces in the *Hindí* pronominal inflexions *mujhé*, *tujhé*, which seem to be identical with *mun-jo* and *to-jo* of the *Sindhí*. This affix may be the adjectival or possessive च *ya* of the Sanskrit: and analogies of both might be pointed out in Greek, as in the nearly synonymous βασιλε-ια and βασιλι-κα. One example of declension will suffice:—

Múrs, a man.

	Singular.	Plural.
Nom. Acc. Voc.	Múrs, a man, oh man.	Márs, men, oh men.
Gen.	Múrsa-jo-jí-jé-jí.	Mársana-jo, &c.
Dat.	Múrsa-khe.	Mársana-khe.
Abl.	Múrsa-khon.	Mársana-khon.

When the nominative ends in the vowel *o* the plural is in *á*: the feminine takes *un* in the plural, as *zál* a woman, *zúlun*.

We do not quarrel with the author for *romanizing* his grammar, as it is principally intended for European students; but we are inclined to cavil at the employment of the Persian alphabet in conjunction with the Roman rather than the Nágarí, which would certainly conform with more facility to the palatials, dentals, and aspirates of the Indian family: बूकरी बिल्ली खा expresses more elegantly as well as more precisely, *Buchhrí billí khon* (from a bad cat) than بچھری بلی کھون.

It is a curious circumstance that most of the masculine substantives and adjectives terminate in *ô*; a peculiarity also remarked in the Zend language, and strikingly exemplified on all the legends of our Bactrian and Indo-Scythic coins, whether in the Greek or in the Pehleví character. The extensive vocabulary attached to the grammar may therefore perhaps prove of use in decyphering these ancient relics; though more might be expected from a scrutiny of the language of the soi-disant descendants of the *Kaíanian* in the *Kohistán*. We recommend M. Masson to collect vocabularies from these people and from the *Sídhposhes*.

One of the most singular anomalies of the *Sindhí* language, is the arrangement of its alphabet, which differs totally from the perfect classification followed throughout the peninsula. The author makes

no remarks on the subject further than that “with one or two exceptions the letters are merely represented by ciphers, combinations of numbers, and fractional parts: for example 111 ($\frac{3}{4}$ ths) for *n*; 8 (4) for *ch*; &c. &c.!”

Having on a former occasion noticed the singular application of the Arabic numerals to the alphabet of the *Maldivé* islands, we were struck with the apparent similarity of the process here pointed out at the opposite extremity of India; but a closer examination removed most of the analogy by shewing that the *Sindhi* and *Múltáni* letters, although strikingly similar in form to the common numerals, were all deducible from the elements of the ordinary Deva-Nágari symbols, and that they are, in fact, but one step removed from the *Márwári* and *Mehajani* of our mercantile class. This we have endeavoured to shew in the accompanying lithographic table (XXII.) (being always happy to add to our catalogue of Indian alphabets!). The *Márwári* (which does not differ essentially from the *Benárasí*) we have added on the authority of gomáshtas residing in *Calcutta*; but it must be remembered that these written characters are peculiar to the mercantile class, and that the learned of *Márwár* and *Sindh*, as of other places, use the Deva-Nágari forms. As to the *arrangement* of their alphabet given by our author on the authority of merchants, it seems to be nothing more nor less than a couple of *memoria-technica* lines contrived to comprehend the whole of the letters combined with their most usual vowel sounds; so that in ordinary writing the merchants may dispense with the application of the *mátras* or vowel-marks. The inconvenience of this omission is not much felt in the limited scope of mercantile correspondence, and in the drafting of hoondees, where the same sentences are constantly repeated. Indeed the first memorial line of the *Sindhi* and *Múltáni* alphabets,

प ज स ल स त ह व ष ण भ इ ट क च द,

pronounced, *Puja salámatí howen ghani Bhai Tek Chand*, (with vowels) generally forms the opening (mutato nomine) of every mehajan's epistle, as may be seen in the example given by our author*. It may be translated “Prayer (or I pray) that health may be abundant to brother Téek Chand.” The continuation is as follows:

छ ब र न थ ड ञ्ठ ग य ड ख व फ घ उ द.

pronounced, *chha ba ra náth ráe řh gajan khatri pha dhau†*.

* The meaning of the specimen of hoondée endorsement lithographed at the foot of the plate is “one half (being) rupees twenty-five, double fifty, to be paid in full.”

† We have ventured to alter one or two of the letters conjecturally, which in the lithographed plate copied from the grammar, are repeated, while those we have substi-

Mārwarī Alphabet, with and without mātras

श्रीदतीधनकीसुखीवनीनमोष्टुगुघट

शु द न ध न ३ म न न न न न द ध ग घ ट
soi d t dh n k s bh w b l m h kh g gh t

आरिपुठजादाय उवीरछेयाणिउरू

अ इ य ठ ज ङ ङ य उ च व छ थ ॥ उ रू
a i p th j d dh y u ch r chh th n jh ph

*Sri datā dhanko subhawe bāla mahi khago ghatang
Aī puṭhaj dadhyu Uchare chhuthaṇ jhapang*

Sindhi or Khudawadi Alphabet.

पु ज ल म ति हो वें अ णि भा र टे क चं द

h j s l m t h w gh ñ bh i t k ch d

छा ब रा ना थ रा जे ठ ग जू म ख त्रि फ डा उ

chh b r n th r è dh g j ñ kh tr ph d u

Multānī or Sarāi Alphabet.

पु ज ल म ति हो वें अ णि भा र टे क चं द

h j s l m t h w gh ñ bh i t k ch d

छा ब रा ना थ रा जे ठ ग जू म ख त्रि फ डा उ

chh b r n th r è dh g j ñ kh tr ph d u

*Puja sulāmātī horei ghani bhāi tēk chand
Chhābra nath rāedh gajānikhatrīpha dāu.*

पु ज ल म ति हो वें अ णि भा र टे क चं द

h j s l m t h w gh ñ bh i t k ch d

Countersign of a Sindhi hūndī.

म ॥ ६ ६ ० ३ ७ ७ ५ ॥ ॥ ६ ६ ० ३ ५ ॥ ॥ ६ ० ॥ ॥

This second line has probably a meaning also, but not a single word of it can be found in the vocabulary; nor can the natives be persuaded to divulge it, whether from superstitious prejudice or from ignorance; it may be merely a nonsense verse embodying the rest of the letters. CHABRANA'TH RAI sounds like a name or title.

The *Márwárí* alphabet contains two poetical lines almost as unintelligible as those of *Sindhí*. As written by our informant a gomáshta in one of the banking houses, and lithographed in Plate XXII. with the vowel marks, they abound in errors, nor could we obtain from him any inkling of their meaning. By dint of persevering inquiry, and aided by the Hindí and the Sanskrit dictionaries, we have restored what seems to be the right reading of the text as follows:

श्री दाता धनका सभाव बाल मोह खग घटं

आई पूठ जड डयो उचरो कथण भफं

or in Roman characters, (differing from the version in the Plate,)

Srī datā dhankā sabhāw, bāla moh khaga ghatang.

A'i pūtha, jar dhayo; Uchari, chattan jhapang.

which, translated as literally as the idiom will allow, is

“Charity (1) of riches is the natural fruit; to me boy, oh god, (2) may it be so.

Reading attained, ignorance is dispelled (3); by good enunciation (4), wisdom (5) instantly (6), (is attained).”

(1.) श्रीदाता masculine, a charitable man. धनको to wealth, सभाव is natural. (2.) खग, the sun, a deity, (WILSON'S Dict.) might lead to the supposition that the couplet was invented while the people were sun-worshippers! घटं *ghatang*, may it happen. (3) डयो from डाना to break down, destroy. (4) उचरो for उचार pronunciation, utterance. (5) कथण a corruption from चेतन intelligence, wisdom. (6) भफं synonymous with भप *jhap*, instantaneously.

At the bottom of the same plate we have inserted the *Sindhí* alphabet as written by their gomáshtas in *Calcutta*; because some of the letters vary from the *Bombay* form; and both differ somewhat from a genuine *Sindhí* alphabet procured by Lieut. LEECH at *Mithyání* on the *Indus*, which we did not receive in time to insert in the plate. The principal variations are in the aspirated letters *kh*, *gh*, *ph*, and *h*; *j* and *y* are expressed by the same character, which is formed as number 2 of the *Máltání* alphabet. The letter ढ is also expressed by ढ which accounts for its absence in the memorial line.

Our author notices the curious custom of affixing certain numbers, ७३|| or 74½; and १|| or 1½ to the commencement of all hoondees and written documents, as not yet satisfactorily explained. Our readers

tuted are there omitted. We have been guided in doing so by the analogy of the forms of the letters to the *Nágari* elements.

Dimensions of the lower Jaw.				
	Fossil Sewálik Monkey.	Semnopithecus Entellus.	Pithecius Rhe- sus.	Ratio of the Se- wálik fossil to the Entellus.
	inches.	inches.	inches.	
1. Extreme length from the anterior margin of the ramus to the middle incisors,	3.6	2.85	2.5	4 3.2
2. Extreme length of jaw ; (calculated in the fossil,)	5.3	4.	3.6	4 3.02
3. Height of jaw, under the 2nd molar measured to the margin of the alveoli,	1.35	1.05	.85	4 3.1
4. Ditto at the rear molars,	1.2	1.1	.95	4 3.6
5. Depth of symphysis,	1.9	1.4	1.1	4 3.
6. Space occupied by the molars,	2.3	1.9	1.5	4 3.3
7. Interval between the 1st molars, . . . . .	.9	.75	.65	4 3.2
8. Antero posterior diameter of the canine, . .	.5	.4	.3	4 3.2
9. Width of jaw behind the chin under the 2nd molar,	1.15	1.05	.95	4 3.7

As in all other tribes of animals in which the species are very numerous, and closely allied in organization, it is next to impossible to distinguish an individual species in the *Quadrumana* from a solitary bone. In the fossil, too, the effects of age have worn off those marks in the teeth, by which an approximation to the subgenus might be made. It very closely resembles the *Semnopithecus Entellus* in form, and comparative dimensions generally. The differences observable are slight. The symphysis is proportionally a little deeper than in *Entellus*, and the height of the body of the jaw somewhat greater. The chin, however, is considerably more compressed laterally under the second molar than in the *Entellus*, and the first molar more elongated and salient. So much of the canine as remains, has exactly the same form as in the *Entellus*, and its proportional size is fully as great. As shown by the dimensions, the jaw is much larger than in the full grown *Entellus*: in the former the length would have been about 5.3 inches, while in the latter it is exactly 4 inches. The fossil was a species of smaller size than the animal to which the specimen described by Messrs. BAKER and DURAND belonged, but less so than it exceeds the *Entellus*.

Our limited means for comparison, restricted to two living species, besides the imperfection of the fossil, and the few characters which it supplies, do not admit of affirming whether it belongs to an existing or extinct species ; but the analogy of the ascertained number of extinct species among the *Sewálik* fossil mammalia, makes it more probable that this monkey is an extinct one than otherwise. There is no doubt

about its differing specifically from the two Indian species with which we have compared it.

The next specimen is shown in fig. 5. It is a fragment of the body of the right side of the lower jaw containing the four rear molars. The teeth are beautifully perfect. It had belonged to an adult although not an aged animal, the last molar having the points a little worn, while the anterior teeth are considerably so. The dimensions, taken along with age, at once prove that it belonged to a different and smaller species than the fossil first noticed.

The dimensions are as follow :—

Dimensions of the lower Jaw.		smaller fossil Sewálík spe- cies.	Larger fossil Sewálík spe- cies.	<i>Sennopithecus</i> <i>Entellus</i> .	<i>Pithecus</i> <i>rhesus</i> .
		inches.	inches.	inches.	
1.	Length of space occupied by the four rear molars,.....	1.48	1.7	1.48	1.25
2.	Height of jaw at the third molar,.....	.95		1.1	.9

The length of jaw, therefore, estimated from the space occupied by the teeth, would be 4 inches, while in the larger fossil it is 5.3 inches; a difference much too great to be dependent merely on varieties of one species. Besides we have another fragment, also belonging to the right side of the lower jaw, and containing the last molar which agrees exactly in size with the corresponding tooth in the figured specimen. This goes to prove the size to have been constant. The fossil, although corresponding precisely in the space occupied by the four rear molars with the *Entellus*, has less height of jaw. There is further a difference in the teeth. In the *Entellus* the heel of the rear molar is a simple flattened oblique surfaced tubercle, rather sharp at the inside. In the fossil, the heel in both fragments is bifid at the inside. The same structure is observable in the heel of the rear molar of the common Indian monkey *P. rhesus*. It is therefore probable that the fossil was a *Pithecus* also. It was considerably larger, however, than the common monkey, and the jaw is more flattened, deeper, and its lower edge much sharper than in the latter. This difference in size and form indicates the species to have been different.

It would appear, therefore, that there are three known species of fossil *Quadrumana* from the *Sewálík* hills: the first a very large species discovered by Messrs. BAKER and DURAND; the second a large species also, but smaller than the first, and considerably larger than

the *Entellus*; the third, of the size of the *Entellus*, and probably a *Pithecus*; and further that two of the three at least, and most probably the third also, belonged to the types of the existing monkeys of the old Continent, in having but five molars, and not to the *Sapajans* of *America*.

There are at present upwards of 150 described species of existing *Quadrumana*; and as the three fossil ones all belonged to the larger sized monkeys, it is probable that there are several more *Sewálik* species to be discovered. We have some specimens of detached teeth, of large size, which we conjecture to be quadrumanous; but their detached state make this conjecture extremely doubtful.

Besides the interest attaching to the first discovery in the fossil state of animals so nearly approaching man in their organization, as the *Quadrumana*, the fact is more especially interesting in the *Sewálik* species, from the fossils with which they are associated. The same beds or different beds of the same formation, from which the *Quadrumana* came, have yielded species of the camel and antelope, and the *Anoplotherium posterogenium*, (nob.): the first two belonging to genera which are now coexistent with man, and the last to a genus characteristic of the oldest tertiary beds in Europe. The facts yielded by the Reptilian orders are still more interesting. Two of the fossil crocodiles of the *Sewáliks* are identical, without even ranging into varieties, with the *Crocodilus biporcatus* and *Leptorynchus Gangeticus* which now inhabit in countless numbers, the rivers of India; while the *Testudinata* are represented by the *Megalochelys Sivalensis* (nob.), a tortoise of enormous dimensions which holds in its order the same rank that the *Iguanodon* and *Megalosaurus* do among the *Saurians*. This huge reptile (the *Megalochelys*)—certainly the most remarkable of all the animals which the *Sewáliks* have yielded—from its size carries the imagination back to the æra of gigantic *Saurians*. We have leg bones derived from it, with corresponding fragments of the shell, larger than the bones in the Indian unicorned *Rhinoceros*!

There is, therefore, in the *Sewálik* fossils, a mixture in the same formation of the types of all ages, from the existing up to that of the chalk; and all coexistent with *Quadrumana*.

P. S. Since the above remarks were put together, we have been led to analyse the character presented by a specimen in our collection which we had conjectured to be quadrumanous. The examination proves it to be so incontestibly. The specimen is represented in figs. A, B, and C, of Pl. XVIII. It is the extra-alveolar portion of the left canine of the upper jaw of a very large species. The identification rests upon two vertical facets of wear, one on the anterior surface, the other on the

inner and posterior side, and the proof is this. The anterior facet *b* has been caused by the habitual abrasion of the upper canine against the rear surface of the lower one, which overlaps it, when the jaws are closed or in action. This facet would prove nothing by itself, as it is common to all aged animals in the carnivora and other tribes in which the upper and lower canines have their surfaces in contact. The second facet *c* must have been caused by the wear of the inner and rear surface of the canine against the outer surface of the first molar of the lower jaw. But to admit of such contact, this molar must have been contiguous with the lower canine, without any blank space intervening; for if there was not this contiguity the upper canine could not touch the lower first molar, and consequently not wear against it. Now, this continuity of the series of molars and canines without a diasteme or blank interval, is only found, throughout the whole animal kingdom*, in man, the *Quadruman*, and the *Anoplotherium*. The fossil canine must therefore have belonged to one of these. It were needless to point out its difference from the human canine, which does not rise above the level of the molars. In all the species of *Anoplotherium* described by Cuvier, the canines, while in a contiguous series with the molars, do not project higher than these, being rudimentary as in man. Of the *Sewdl*ik species, *Anoplotherium posterogenium*, (nob.) we have not yet seen the canines; but it is very improbable, and perhaps impossible, that the fossil could belong to it. For if this species had a salient canine, it must have been separated from the molars by an interval as in the other *Pachydermata*; otherwise the jaws would get locked by the canines and molars, and the lateral motion required by the structure of the teeth, and its herbivorous habit, would be impracticable; and if there was this interval, the upper canine could not have the posterior facet of wear. The fossil canine must therefore have belonged to a quadrumanous animal. This inference is further borne out by the detrition of the fossil exactly corresponding with that of the canines of old monkeys.

The dimensions are:—

Length of the fragment of canine,	1.75 inches.
Antero-posterior diameter at the base, .....	.8
Transverse ditto, .....	.7
Width of the anterior facet of wear, .....	.6

The two diameters are greater than those of the canine of the *Sumatra* Orang-otang described by Dr. CLARKE ABEL† as having been $7\frac{1}{2}$

* Cuvier Ossemens fossil, tome 3, p. 15.

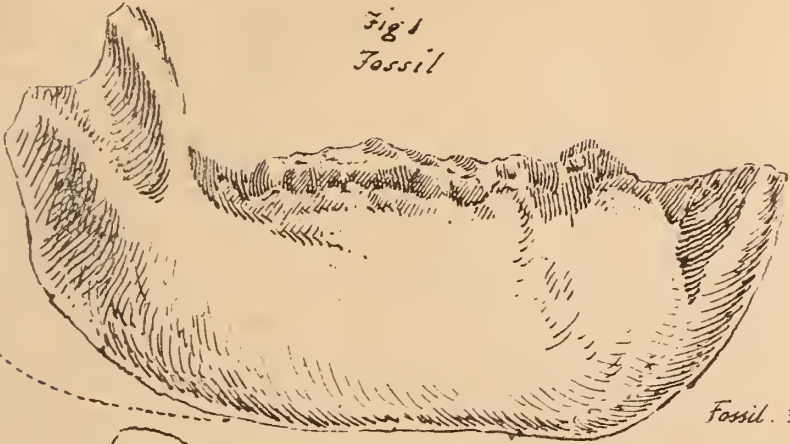
† Asiatic Researches, vol. 15, p. 498.

feet high. The *Cynocephali* have large and stout canines, more so comparatively than the other *Quadrumana*. But to what section of the tribe our fossil belonged, we have not a conjecture to offer. We may remark, however, that the tooth is not channelled on three sides at the base, as in the *Entellus*. Does the fossil belong to the same species, as the jaw discovered by MESSRS. BAKER and DURAND, or to a larger one?

NOTE. We have sketched Dr. FALCONER's highly curious fossil tooth in position with the lower jaw of the Sumatran Orang-otang from the Society's Museum, in figure C of Pl. XVIII. There is a third facet of wear at the lower extremity *d* which, on reference, we find Dr. FALCONER attributes like *c* to attrition against the first molar, being observable, he says, in many aged animals. The worn surfaces *c* and *d* are uniformly polished, and have evidently originated from attrition against a tooth; but with regard to the principal facet *b*, we confess we have a degree of scepticism, which can only be removed by a certainty that the fossil had been seen extracted from the matrix. In the first place, the great extent of the worn surface and its perfect flatness could hardly be caused by attrition against the lower canine which should produce a curvature measured by the length of the jaw as radius. In the next place, the enamel of the tooth is less worn than the interior and softer part of the fossil: and thirdly, on examination with a magnifier, numerous scratches are visible in divers directions: all these indicating that the facet may have been produced *on the fossil*, by grinding it on a file, or some hard flat surface. On shewing the fossil to MADHUSUDANA, the medical pandit of the Hindu College, he at once pronounced that the tooth had been ground down to be used in medicine, being a sovereign specific in the native pharmacopeia. This circumstance need not necessarily affect the question, for it is probable that the native druggist would commence his rubbing on the natural plane, if any presented itself to his choice: but Dr. FALCONER and Capt. CAUTLEY, to whom we have returned the fossil with a communication of our doubts, assure us in reply that the fossil tooth was brought in along with a large collection, so that there is every improbability of its having been in possession of a native druggist. At any rate it is not on the front wear that they so much rest their argument of its origin, as on the posterior abrasion which could only happen in the jaw of a quadrumanous animal. In fact they have recent quadrumana shewing precisely similar wear on a small scale, and no other head will do so. We find only one exception in the Society's museum, viz. the tapir, whose right upper incisor (or non-salient canine) falling between the two lower ones is worn nearly in the fashion of the fossil: but it is less elongated.—ED.

FOSSIL
QUADRU MANA SEWALIK HILLS

Fig. 1
Fossil



Fossil. Fig. 4

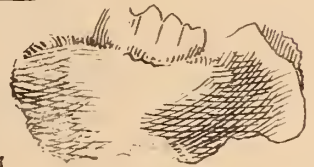


Fig. 2
S. entellus



Fossil. Fig. 5

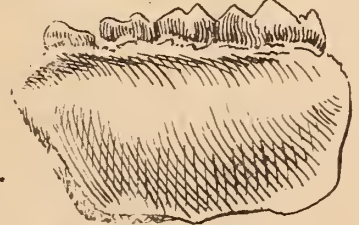
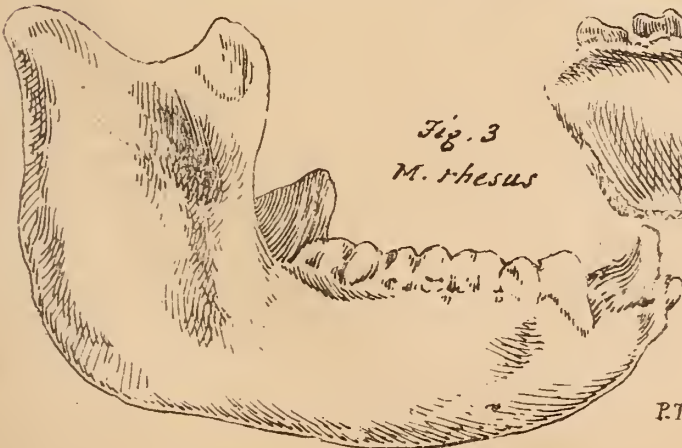


Fig. 3
M. rhesus



V.—On some new Genera of *Raptores*, with remarks on the old genera.

By B. H. HODGSON, Esq.

I have the honor to submit, herewith, some original and amended generic characters of new forms of *Raptores* which have been described particularly in various numbers of your Journal. Those who are best acquainted with the present state of classification in regard to the *Falconidæ* and *Strigidæ* will, I apprehend, be most ready to make allowance for any possible imperfections cleaving to these characters.

Family FALCONIDÆ. Sub-family AQUILINÆ. Genus *Nisaetus*, nob.

Bill short*, at base as high as broad, distinguished by compression without feebleness, strongly festooned. Nares large, vertical, elliptic, angulated, and wholly lateral in exposure. Wings short, firm; 5th quill longest. Tail long, firm, and square. Tarsi elevate, but not feeble, wholly feathered.

Digits elongated, nervous; the inner fore and the hind highly developed.

Acropodia reticulate with three or four scales next each talon. Talons immense, very unequal, strong and acute. Head usually crested.

Types, *N. Pulcher*, No. 680; *N. Nipalensis*, No. 9; *N. Pallidus* No. 8; *N. Grandis*, No. 7, nobis.

Habits. Preys on jungle fowl, partridges, hares: watches from a lofty perch, usually pouncing on its game when near it; sometimes pursues with energy on the wing; flight direct; does not seize on the wing. *Habitat*, saul forest, Taraï, and lesser hills. Not migratory; size rather large. Connects the most typical hawks with the most typical eagles. Digits and talons pre-eminently raptorial.

FALCONINÆ. Genus *Baza*, nob.

Bill as in *Ierax*, but somewhat longer and more compressed before the cere. Upper mandible with two long sharp teeth on either side, close to each other and to the hook, and directed forwards. Lower mandible with three or four smaller teeth correspondent to the above. Orbits and lores thickly and softly plumed. Nares transverse, rimiform, with the cere behind them membranous and free. Legs and feet short and thick. Tarsi half plumed, coarsely reticulate, longer than any digit. Toes cleft and depressed: the laterals subequal; the inner longer than the outer; the hind large. Acropodia wholly

* Short with reference to the *sub-family*: and so of all the generic terms subsequently employed; for instance, ears small and simple, in reference to scops, as a genus of the *sub-typical group* of *Strigidæ*.

scaled. Talons sub-equal, acute, wings long, broad-webbed, sub-equal to the tail; 3rd quill longest; notch of the inner web remoter than in *Falco* or in *Ierax*. Head crested.

Type, *Baza Syama**, nob. No. 657. *Habitat*, lower region of hills: size small; make robust: habits insectivorous.

Affinities various with *Cymindis*, *Harpagus*, *Ierax* and *Pernis*†. Not known to Indian falconers. Station in VIGOR's arrangement, at the head of the *Falconinæ*, between *Harpagus* and *Ierax*.

STRIGIDÆ, Aberrant group. Sw.

Disc and conch evanescent: cars simple. Sub-family of the eagle owls, or *Ætoglaucinae*, nob.

Egrets conspicuous: great size and strength. Sub-diurnal questing. A very strong elongated bill. Eminently raptorial feet, and ample gradated wings, equal or nearly so to the medial square tail.

Genus *Huhúa*, nob.

Bill equal to the head, basally straightened beyond the cere, suddenly hooked, very strong, festooned, with trenchant scarp to the tip.

Nares ovoid, transverse, partially exposed. Wings sub-equal to the tail: 4th and 5th quills sub-equal and longest. Tarsi short, immensely stout, thickly plumed. Toes very strong, hirsutely plumose, partially denuded and scaled; the exterior antagonising but *not* versatile. Talons immense, acute, very unequal; the inner fore conspicuously largest; and hind equal to the outer fore.

Type, *Huhúa Nipalensis*, nob. No. 54‡. *Habitat*, all three regions of the hills. Habits subdiurnal and mammalivorous.

Genus *Cultrunguis*, nob.

Bill equal to head, straightened as far as the cere, gradually curved beyond it, moderately compressed, strong. Nares elliptic, partially exposed. Wings unpectenated, equal to the tail; 4th quill longest. Tarsi sub-elevate, strong, compressed, partially or wholly nude, reticulate. Toes long, nervous, compressed, reticulate, with three or four scales next each talon; the anterior digits sub-equal; the hind large. Soles of the feet aculeated. Talons sub-equal, compressed, strong, cultrated below§.

* *Syama*, in Sanskrit, means black-blue.

† I should rather say, affinities with *Harpagus* and *Ierax*. Analogies with *Cymindis* and *Pernis*. Our bird is, unquestionably, a Falconine type—which *Cymindis* and *Pernis* are *not*.

‡ N. B. The numbers refer to the series of specimens and drawings in London.

§ Unde nomen genericum: the strong and nearly equal talons are sloped from a round back or culmen to an inferior edge, which is as sharp as a knife, and

Types, *C. Flavipes* et *C. Nigripes*, nob. Nos. 55 and 56. *Habitat*, the lower region of the hills. Habits diurnal and piscivorous. Size large.

Remarks. In my judgment, *Huhúa* is the equivalent of *Aquila*, and *Cultrunguis* of *Pandion*, among the diurnal *Raptores*, which are, no doubt, represented by the nocturnal *Raptores* in nature, though not yet in our systems. Those systems wholly want a Strigine sub-family answering to the *Aquilina*.

The section, therefore, standing at the head of my two genera must be understood as resting on no better authority than my own. It is probable that the evanescent character of the disc and conch with the absence of the operculum, belong to the hawk and falcon owls as well as to eagle owls; and that the contradistinctive marks of the latter must be sought, in their great size, their prolonged but strong bill, their formidable legs, feet and talons, their ample gradated wings, and their medial and even tails. All these marks, not less than the former ones, characterise our *Huhúa* and *Cultrunguis*: whereas our *Ninox*, which is small, and has its bill, wings and tail formed on the Falconine model, is yet equally distinguished with *Huhúa* and *Cultrunguis*, by evanescent disc and conch, and perfectly simple small ears. Hence my impression of the very great prevalence of the latter characters, which seem to extend over *all* the aberrant sub-families of the *Strigidae*, accompanied by egrets in the eagle owls, but *not* so in the hawk and falcon owls—witness *Noctua* and *Ninox*. The presence or absence of egrets cannot be taken as a *primary* mark of the aberrant group; for to it *Huhúa* and *Cultrunguis* unquestionably belong, and both these types are egretted. Whether the egrets even constitute a *secondary* or sub-family mark of this group, may be doubted: but, at present, this would seem to be the case, and in conformity with this notion I have inserted egrets as one of the sub-family marks. There is no uniting accuracy with precision in generic characters, so long as we want family and sub-family characters. How then to characterise our *Ninox*?—a falconine type in its own circle of the *Strigidae*, and as expressly equivalent to the lesser insectivorous falcons, as *Cultrunguis* is to *Pandion*. When recently defining *Ninox* I begun with, ‘bill, disc, conch and feet, as in *Noctua*,’ considering that genus—which is so remarkable in the family for its firm plumage and short wings as well as for the absence of those pre-eminently Strigine is eminently calculated, with the aid of the spinous sole of the foot, to clutch the bodies of fish. No analogy can be more beautiful than that of *Cultrunguis* to *Pandion*.

characters, the great disc and operculated ears—as a conspicuous type. Yet hardly three months elapsed when I received from England a systematic work from which *Noctua* is wholly expunged! *Noctua*, however, will, I think, retain its place, characterised in the aberrant group of the owls by short wings and firm plumage, and leading through *Surnia* to our *Ninox*, which I believe to be the least Strigine bird on record. Let us now attempt to define it, as a genus belonging to the aberrant group of the *Strigida*, characterised as before.

Genus *Ninox*, nob.

Bill short, arched from the base. Nares round, antea, apert, tumid. General contour with the character of the plumage, extremely Falconine. Wings long, firm, unpectenated, sub-equal to the tail; 3rd quill longest; 1st and 2nd very moderately gradated. Tail long, firm, even. Tarsi plumose, rather short. Toes medial, depressed, bordered, rigidly hirsute; laterals equal, hind compressed. Head smooth, small, and only Strigine in the size and position of the eye.

Type, *Ninox Nipalensis*, nob. No. 657

Habitat, central and lower hills. *Habits*, subdiurnal and insectivorous.

Mr. SWAINSON appears to have laid undue stress on the egrets of the owls, which seem to me but little more influential than the analogous crests of the *Falconida*, and more especially of the *Aquilina*. Disc and conch evanescent, and ears simple, are the marks of the aberrant group, taken as a *whole*. Egrets, added to great size, ample gradated wings, and a medial even tail, with powerful legs and feet and talons, seem to me the subordinate signs of the *Aëtoglaucina* or aquiline sub-family of that group. Of the *Falcoglaucina* or sub-family typifying the *Falconina*, the first glimpse appears to be afforded by our *Ninox*, which has quite the proportions and aspect of many of the lesser insectivorous Falcons. Long and firm wings and tail—the latter even; and the former but slightly gradated; and both, in a word, adapted for strong flight—would seem to be *necessary* characters of this sub-family, and they are, at all events, characters eminently conspicuous in our *Ninox*. Between the wings of *Ninox* and those of *Strix* or *Otus* there is just the same sort of difference as exists between the wings of *Falco* and those of *Buteo*, or of *Milvus*—I mean as to suitability for vigorous flight, and expressly without special reference to the technical form of the wing.

The following comparative measurements of *Baza*, a small insectivorous Falcon, and of *Ninox*, a small insectivorous Falconine owl, can scarcely fail to excite interest. The measures are given in English feet and inches.

						<i>Baza.</i>	<i>Ninox.</i>
Total length,	...	...	...	...	...	1 0 $\frac{1}{8}$	1 0 $\frac{1}{4}$
Length of bill, straight, to gape,				...	...	0 0 $\frac{7}{8}$	0 0 $\frac{7}{8}$
Basal height of bill, extreme,	...	...	...	...	...	0 0 $\frac{3}{4}$	0 0 $\frac{7}{8}$
Basal width of bill, extreme,	...	...	...	...	...	0 0 $1\frac{3}{8}$	0 0 $\frac{7}{8}$
Head straight, from gape to occiput,				...	...	0 1 $\frac{1}{4}$	0 1 $\frac{1}{4}$
Length of tail,	...	...	...	...	...	0 6	0 6
Tarsus, from inner salient angle above, to the sole,						0 1 $\frac{1}{4}$	0 1 $\frac{1}{4}$
Length of central digit, from extreme base to superior insertion of the talon,				...	...	0 1 $\frac{1}{8}$	0 1 $\frac{3}{8}$
Length of exterior digit,	...	...	...	...	...	0 0 $1\frac{1}{8}$	0 0 $1\frac{5}{8}$
Length of interior digit,	...	...	...	...	...	less $\frac{1}{8}$	0 0 $1\frac{5}{8}$
Length of hind digit,	...	...	...	...	...	0 0 $\frac{9}{16}$	0 0 $\frac{1}{4}$
Straight length of central talon,	...	...	...	...	...	0 0 $1\frac{3}{8}$	0 0 $1\frac{3}{8}$
Ditto ditto exterior ditto,	...	...	...	...	...	0 0 $1\frac{6}{8}$	0 0 $1\frac{9}{8}$
Ditto ditto interior ditto,	...	...	...	...	...	0 0 $1\frac{3}{8}$	0 0 $1\frac{6}{8}$
Ditto ditto hind ditto,	...	...	...	...	...	0 0 $1\frac{9}{16}$	0 0 $1\frac{7}{8}$
Expanse of wings,	...	...	...	...	...	2 5 $\frac{1}{2}$	2 4 $\frac{1}{2}$
Length of a closed wing,	...	...	...	...	...	0 9 $\frac{1}{2}$	0 9 $\frac{1}{8}$
Longer diameter of opening of ear,	...	...	...	...	...	0 0 $1\frac{3}{8}$	0 0 $1\frac{3}{8}$
Diameter of the eye,	...	...	...	...	...	0 0 $1\frac{6}{8}$	0 0 $1\frac{9}{8}$
Weight of the birds,	...	...	...	...	...	7 $\frac{1}{2}$ oz.	7 $\frac{1}{2}$ oz.

To render this singular parallelism complete, I may add, that both birds are mature males of their respective species; that the females are scarcely larger and not at all different in aspect; that both are eminently conspicuous for the *insessorial* character of their feet, the digits of which are cleft to their origins, the soles quite flat and somewhat bordered; the anterior laterals of equal *strength* and *size*, and the central of the same thickness, and of very moderate excess of length. Wings and tail could not, in a Strigine bird, be more Falconine than those of *Ninox*; and hence these organs are almost precisely similar, both in form and proportion, to the same organs in *Baza*, which, though a Falconine bird, deviates widely from the restricted or *generic* type*. Upon the whole, the only material differences of these birds are the inferior strength of the thumb with its talon, and the superior size of the eye, in *Ninox*—both differences eminently interesting, in as much as none are more universally and distinctly referable to the respective habits and exigencies of the two families of the nocturnal and diurnal *Raptores*.

* *Peregrinus*, *Icelandicus*, &c. I exclude *Tinnunculus*, &c., under the separate sub-generic title of *Falcula*.

Mr. SWAINSON, in treating of the *Falconidæ* and *Strigidæ*, has seen perpetual reason to deplore the errors of systematic works.

In truth, it is hardly too much to say that the majority of recorded species are no species at all; and the majority of recorded genera insufficient or inaccurate.

The old species, described by color only, and when classification was in its infancy, cannot now be really appreciated except by personal examination. Nor can any words of condemnation be too strong for the modern practice of inserting these species, without such examination, under the strict subdivisions elaborated by recent science.

Such insertion must be made haphazard, and nothing is more common than to find one species registered in half a dozen genera, none of which suit it, or, if so, only by accident! For systematic writers now to rely on dried skins, is sufficiently objectionable: but their reliance on the old book descriptions is perfectly monstrous.

Mr. SWAINSON—*clarum et venerabile nomen*—has acknowledged with unusual explicitness that the examination of *fresh* subjects is, very generally, an indispensable condition of accuracy, and that, for all the higher purposes of science, an acquaintance with *habits*, as well as with structure, is required. Will it, then, be credited that, with almost all our recorded species calling for revision, and with our classification labouring, in vain, to advance per rudem indigestamque molem specierum, there is no sense on the part of Zoological associations at home of the necessity of any thing more than the collection of dried skins?

Such, however, is the fact; upon which I forbear, at present, from any comments, returning gladly to Mr. SWAINSON—whom any one would be proud to assist, if able; and, as I have some little practical experience of raptorial birds, and of the value of the generic characters assigned to them in books, I shall indicate what I conceive to be the diagnostics of some received genera.

AQUILINÆ. Genus *Pandion*.

Bill and head compressed. Gape narrow. Bill moderate, extremely rounded on the ridge, highly festooned; tomia sculpt and very trenchant. Brow not salient. Lores and cere almost nude. Nares rimiform, subtransverse, with the cere behind them membranous and free. Legs and feet spiculated, strong, compressed, nude, and reticulate. Toes nervous, cleft; the outer versatile with oblique grasp; the hind, very mobile. Talons highly falcated, nearly equal, compressed, rounded below. Wings exceedingly long, surpassing the tail; 3rd quill longest. Instances, *P. Vulgaris*, *P. Indicus*, nob. No. 715.

HALIAETUS. Sub-genus of *Pandion*?

Contradistinguished by a long bill, much more compressed on the ridge; by shorter, rounder wings, never surpassing and seldom equaling the tail, and which have the 4th and 5th quills sub-equal and longest; by wide, transverse nares of irregular form; by scaled tarsi and toes, in which moreover the spinous aculeation of *Pandion* is less developed, and the exterior and hind toes are less mobile; and, lastly, by talons less compressed and less rounded below—sometimes squared.

Types. *Haliaetus Ichthyætus Horsfieldii*, *Plumbeus et Albipes*, nob. Nos. 10 and 3.

The bill of *Haliaetus* is always longer and sharper on the culmen than in *Pandion*; but in some species, its cutting edge is as highly festooned as in *Pandion*; in others, it is as level as in *Aquila*: in some again the wings are considerably shorter than the tail; in others, equal to it.

Instances of the former peculiarities, *Ichthyætus et Plumbeus*; of the latter, *Albipes*. *Haliaetus* is further distinguished from *Pandion* by a nude salient brow: but both genera are alike remarkable for the compression of the bill and head, as compared with *Aquila*, and also for the smallness of the gape.

The very long unfestooned bill of *Albipes* is accompanied by a wider gape, by wings equal to the tail, by great size, and by talons perfectly squared below.

If *Ichthyætus*, then, be the type of *Haliaetus*—and no doubt it is—then *Albipes* is a separate type bearing the same relation to *Aquila*, as *Ichthyætus* to *Pandion*, and connecting *Aquila*, through *Haliaetus*, with *Pandion*. This type I have provisionally named *Cuncuma*, from its native name. It is a fisher, but not exclusively so; and is remarkable, like the bird of *Washington*, for its theftuous propensities*.

Pandion is the king of fishers, and a more beautiful instance of the adaptation of structure to habits than this genus exhibits, is not to be found in the whole circle of ornithology. The rimiform nares may be

* I make no allusion to birds which I am not personally familiar with; but I suspect that the American bird adverted to has a very strict resemblance to our *Albipes*, a resemblance including habits, size, and structure. If this be the case, it may be ranged by the side of *Albipes* under the sub-genus *Cuncuma*, of which the following are the characters. Bill long and void of festoon. Wings equal to the tail. Talons squared below. Size very great. There is a beautiful gradation of characters in these sub-genera, and a correspondent modification of manners, by means of which the type of the fishing eagles is linked with the type of the mammalivorous eagles.

closed by the lax membrane behind them so as to exclude the water : the compressed, spiculated, free toes, of which the outer fore may be turned quite back, and the hind almost forward, aided by the compressed cylindric and highly curved talons, are the very weapons to take fish with ; whilst the immense wings enable the bird to quit his own element with impunity, and to bear off, from the bosom of the waters, fish of far greater weight than himself. Falcons trained to duck-hunting dare not suffer the water to touch their plumage, always quitting their grasp if the quarry can near it in the struggle. But *Pandion* will plunge dauntlessly into the deep, and will strike fish so large that they sometimes carry him under and destroy him, though he has nothing to forbear from a fish twice his own weight. In India the birds of this genus are not migratory : they breed in lofty trees overhanging large lakes, laying their eggs in April, May ; and rearing two young, which usually quit the nest in June, July. The white-footed *Cuncum* (*Haliastur Albipes*) (which is a vastly larger bird) frequently robs the Indian *Pandion* of his spoil, just as the white-headed species of the West does the *Pandion* of that region. Those who have classed the *Brahmaní Cheel* of India (*Haliastur Pandicerianus*) with the fishing eagles, may be safely said to know as little of the structure, as of the habits of that paltry Milvine bird ; or else of the group with which they have associated it. True, *Pandicerianus* has a festooned bill* : but its feet are those of *Buteo* or of *Milvus*, without a trace of the peculiar structure of those organs in the piscatory eagles. Its chief food is insects, and its manner of questing similar to that of *Circus*. It feeds freely on dead fish and on other carrion in winter.

STRIGIDÆ.

Typical group. Disc and conch immense. Ears large and operculated. Sub-genus *Strix*.

Bill longer than the head, straightened, shallow, feeble, with the

* The armed bill, however, insisted on as a pre-eminent mark of the *Raptores*, has as much reference to *insectivorous* habits as to more noble ones. And whenever the tooth or festoon of the bill is, however highly developed, rather sharp than strong, insectivorous habits may be safely inferred. These sharp processes of the bill remind one of the peculiar character of the teeth in the lesser insectivorous carnivora, such as *Herpestes*. Here also there is high development *without* concomitant strength : and if we look through the typical sub-family of the diurnal *Raptores*, we shall find the dentation of the bill most developed, in *one* sense, among the lesser insectivorous genera, such as our *Baza Elanas*, as well as the *Brahmaní Cheel*, may be cited to prove that a *festooned* bill does not, per se, imply noble habits.

maxilla cut out by large nasal fossæ. Nares longitudinal and lunated. Valve of the ear definite, tetragonal. Wings long, feeble, exceeding the short and feeble tail: 2nd quill longest. Tarsi long, slender, partially implumose. External toe basally connected as in *Falco*. Central talon pectinated.

Type, *S. Flammea*.

OTUS.

Head more or less egretted. Bill short, wholly arched on the culmen, high and deep at the base. Valve of the ear indefinite, confluent with the immense valvular disc, the opposite sides of which are connected over the ear passage by a membranous ligament. Wings long, feeble, scarcely or not at all exceeding the tail; 2nd quill longest; 1st strongly notched near the tip. Tarsi and toes short and plumose.

Types, *Otus Vulgaris* et *Brachyotus*.

Sub-typical group.

Disc and conch medial, perfect. Ears smaller, operculated.

Genus SCOPS.

Bill short, arched from the base, nostrils round, tumid. Head egretted. Ears simple, small*. Wings medial, sub-equal to the tail: 3rd and 4th quills sub-equal and longest. Toes feeble, nude, sub-depressed. Plumage soft and vermiculated. Size small. Habits insectivorous and nocturnal.

Instances. *Scops Sunia*, *Scops Lettia*†, *Scops Pennata*, nob. Nos. 64, 66, 721, respectively.

Aberrant group.

Disc and conch evanescent. Ears small and simple.

NOCTUA.

Bill short, arched from the base. Nostrils round, very tumid, sometimes tubular. Head smooth. Toes hairy, feeble, and sub-depressed. Wings short, scarcely exceeding the base of the tail; 4th quill longest. Tail slightly elongated, rounded. Plumage firm and lined. Size small. Insectivorous and nocturnal.

Instances. *N. Cuculoides*, GOULD; *N. Auribarbis*; *N. Tarayensis*; *N. Perlineata*; *N. Tubiger*, nob. Nos. 67, 63. 707, 486, respectively.

* Small and simple with reference to the group. The ears are, in fact, nearly twice as large as in the proximate genus *Noctua*, which I have ranged in the aberrant group.

† *Scops Lettia* is possibly the *Asio auctorum*: but there is no safe quoting of species from books. *Asio* has been made a *Scops*, an *Otus*, or any thing else, at the discretion of the discreet!

Scops seems to me to stand on the confines of the sub-typical group, leading to *Noctua* as among the first of the aberrant group. One is egretted, the other not; one has the plumage characteristically soft and lax, the other has the plumage, including the alar and caudal feathers, a good deal firmer. The wings of one scarcely surpass the base of the tail, those of the other reach nearly to its tip.

The disc of the one is nearly perfect, and the ears comparatively large, though simple. The disc of the other is very imperfect, and the ears much smaller. So also the eye and head*. The one has nude toes, and the other hirsute one. Lastly, a very maculate vest seems as common with *Scops*, as a lineated garb with *Noctua*. The size of both is small; both have an Otine bill with feeble feet; and both are nocturnal and insectivorous.

The above characters of known genera are, of course, mere suggestions, as emanating from one who has neither museum nor library at command. But, if practical experience be of any worth, they are suggestions which the skilful may take much advantage of, I suspect that plumage *very* soft, *moderately* soft, and more or less *hardened* or *firm*, might be ascribed, respectively, to the typical, sub-typical, and aberrant groups of the *Strigidae* with safety and advantage.

I have great doubts as to the position of our *Urrua* and *Bulaca*. By the elongation and strength of the bill they are affined to the eagle owls; but the high development of the disc and conch, though far short of *Otus*, yet seems to indicate the position of these birds to be the sub-typical group. Though very similar in structure and size, one has the egrets, as well as subdiurnal habits and pale iris of *Otus*; but in this (*Urrua*) the valve of the ear is evanescent: whilst the other (*Bulaca*) with the smooth head and valved ear, has also the nocturnal habits and dark iris of *Strix*. The size of both is greater than that of either of these genera. In *Scops* the size and character of the disc and conch are very similar to those of *Urrua*: but the former is a small nocturnal and insectivorous bird; the latter, a large, semi-diurnal and mammalivorous one. *Bulaca* again, with something of the aspect, and with entirely the manners, of *Strix*, is sundered from *Strix*, toto cœlo, by the strength of its bill, the high gradation of its wings,

* The relative volume of the head amongst Strigine birds is more apparent than real. It is caused by the immense quantity of plumes protecting the conch when the ear has much of the peculiar family structure; and consequently this feature is quite as noticeable in *Otus* as in *Strix*; because in the former genus the ear is even *more* signally Strigine than in the latter.

and the superior length and firmness of its tail, as well as by its short and strong legs. In the last respect there is a close resemblance on the part of *Bulaca* to *Otus*; but the conch and disc are not half the size that they are in *Otus*; the conch is oval, and the definite form of the ear-valve is quite opposed to the character of this organ in *Otus*, agreeing more closely with *Strix*. The long and feeble wings and short and feeble tails of *Strix* and of *Otus*, are characters peculiarly their own: and they are united with, in the former, a bill so long and feeble, and, in the other, a bill so short and arched, that there is no mistaking the combination of these attributes in either genus. I know no Strigine type at all agreeing with *Strix* in the character of the bill, taking its feebleness and length together. But, it is a grievous mistake to suppose, with CUVIER, that *Strix* alone exhibits either elongation or straightness in this member: for, not only our *Huhúa* and *Cultrunguis* have a long and straightened bill; but these characters are distinctly, though less, developed in *Urrua* and in *Bulaca*.

The otine form of the rostrum (short, thick, and wholly curved) no doubt is very prevalent among the *Strigidae*; since it is possessed in common by *Otus*, *Bubo*, *Scops*, *Noctua*, and *Ninox*. But the tumidity of the nares in the three last is not found in the first: and *Ninox* (not to mention its smooth head, divested of all Strigine characteristics save the size of the eye) is sundered wholly from *Otus* by its firm plumage, and by the length and strength of both wings and tail. In *Otus* the tail, though longer, is as feeble as in *Strix*; and in both these genera the wings, though long, have all the flimsiness proper to the family.

Noctua, by its firm plumage (including wings and tail) as well as by its depressed perching hairy feet, its evanescent disc, simple small ears, smooth head, and short arched bill with tumid round nares, makes the nearest approach to our *Ninox*. But shortness in the wing is the pre-eminent attribute of *Noctua*, whilst the very opposite is that of *Ninox*. In *Surnia* the wings appear to be rather short, and the tail, though long, is extremely wedged. In *Ninox* alone have we wings and tail formed upon the Falconine model. And these peculiarities, taken in connexion with feet in which the insectorial character prevails almost over the Raptorial—just as it does in many of the little insectivorous Falcons—constitute our *Ninox* a signal type. Our *Cultrunguis* is equally conspicuous by its Pandionic feet and habits; and our *Huhúa* by its combination of aquiline attributes—the chief of which are pre-eminent size and strength, and a bill uniting length and straightness with enormous power. I am quite certain that both these birds

represent the sub-family of the eagles, in the aberrant group of the *Strigidae*; and not merely so, but precisely, *Aquila* and *Pandion*. But as to the situation of *Urrua* and *Bulaca*, or as to their analogies, I am quite at a loss. Taking, however, as my guide the *medial size of the disc and conch*, I shall class them, for the present, in the sub-typical group, characterised as before; and the following generic characters may, I hope, serve to make them understood, in themselves and in their relations.

STRIGIDÆ.

Sub-typical group.

Genus URRUA, nob.

Bill sub-equal to the head, somewhat elongated, scarcely arched from the base, compressed, strong. Nares ovoid, transverse. Wings and tail somewhat elongated: wings moderately gradated, 3rd and 4th quills sub-equal and longest. Tail not bowed, even. Tarsi and toes plumose. Tarsi elevate, not feeble. Head egretted. Ears scarcely valved, oval, traversed by a membranous thong. Size considerable. Habits sub-diurnal. Dwells frequently in holes on steep bank-sides.

Type, *Urrua Cavearea*, nob. No. 57.

Genus BULACA, nob.

Bill sub-equal to the head, somewhat elongated, scarcely arched from the base, compressed, strong. Nares elliptic, transverse, tumid. Wings conspicuously gradated; considerably shorter than the tail; 5th and 6th quills longest and sub-equal. Tail sufficiently elongated, bowed. Conch ovoid. Legs and feet, short, strong, plumose. Head smooth. Habits nocturnal. Size considerable.

Type, *Bulaca Newarensis*, nob. No. 59.

It is quite out of the question to range *Urrua* with *Otus*, because of the greatly inferior size of the disc and conch; or with *Bubo*, because of the length of the legs; or with either, because the bill is decidedly, though not conspicuously, elongated and straightened. Equally impossible is it to range *Bulaca* with *Strix* or with *Otus*; because its disc, though perfect, is not larger than in *Urrua*; because its bill is (like that of *Urrua*) stronger and shorter than that of *Strix*, longer and less arched than that of *Otus*; and because its wings have characters quite opposite to those of either genus.

Urrua has the sub-diurnal habits, the pale iris and the egrets of *Otus*; *Bulaca*, the nocturnal habits, the dark iris, and the smooth head of *Strix*. In both the orifice of the ear is oval, but large ($1\frac{2}{3}$ inch long). In *Bulaca* it has a large distinct valve: in *Urrua*, scarcely any. In neither is there any appearance of the long circular denuded line

defining the course of the disc in *Strix* and *Otus*, and seeming, as it were, to lay bare the whole head.

This organ, both in size and character, is *essentially* mediate in these birds, between the typical structure as seen in *Strix* and *Otus*; and the aberrant structure, as exhibited in *Noctua*, *Ninox*, *Huhúa*, and *Cultrunguis*.

The following comparative measurements, in English inches, may help the curious to appreciate the value of those perplexing but necessary terms, *long* and *short*, as applied to bills, tails, and legs.

	Length of the bird.	of the tail.	of the tarsus.	of the bill.
<i>Strix</i> ,	$14\frac{1}{2}$	$5\frac{1}{4}$	$3\frac{1}{4}$	$1\frac{3}{4}$
<i>Otus</i> ,	$14\frac{1}{2}$	6	2	$1\frac{1}{4}$
<i>Urrua</i> ,	22	$9\frac{3}{4}$	$3\frac{1}{2}$	$1\frac{7}{8}$
<i>Bulaca</i> ,	22	$9\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{7}{8}$
<i>Scops</i> ,	$9\frac{1}{2}$	$3\frac{3}{4}$	$1\frac{1}{2}$	$\frac{7}{8}$
<i>Noctua</i> ,	$9\frac{1}{2}$	4	$1\frac{1}{2}$	$\frac{7}{8}$
<i>Ninox</i> ,	12	6	$1\frac{3}{16}$	$\frac{7}{8}$
<i>Huhúa</i> ,	30	12	$3\frac{1}{8}$	$2\frac{3}{16}$
<i>Cultrunguis</i> ,	24	$9\frac{3}{4}$	$3\frac{7}{8}$	$2\frac{1}{8}$

P. S. Since the above paper was composed, I have received, from the lower hills, a fine specimen of the *Strix Coromandra* of LATHAM. With the size it has all the characters too, of our *Urrua*, except in the legs, the tarsi being lower, and the toes scopine but stronger. The opening of the ear is about one inch, long, ovoid, and not valvular, though the membranous edge be more or less free all round it. I know nothing yet of the *habits* of this bird. If they agree with those of *Urrua*, it may form a species of this genus or sub-genus; and its toes are not absolutely nude, though nearly so. But it seems to be an osculant species leading to *Scops*. The wings and tail are both somewhat elongated, and sufficiently firm, though the general plumage be remarkably soft. The wings are not much short of the tail, and they have the 3rd quill longest, the 4th nearly as long; the first and second, moderately gradated. The toes, which are longish and not feeble, are remarkable for a softly papillose and flattish sole. To the external one there is a vague basal membrane; and the hind is stronger than usual. The talons are sufficiently elongated and acute; the inner and central, the outer and hind, being respectively equal.

The nostrils are nearly round and somewhat tumid: the bill, like that of *Urrua* and *Bulaca*, combines strength with a tendency to elongation and straightness, not noticeable in *Otus*. My bird is a mature female, 21 inches long, of which the bill is $1\frac{3}{4}$, and the tail $9\frac{1}{8}$, the tarsus is $2\frac{3}{4}$, and the central toe $1\frac{7}{8}$.

VI.—*Observations of the Magnetic Dip and Intensity at Madras. By*
T. G. TAYLOR, Esq. H. C. Astronomer.

Notwithstanding the value which has of late years been attached to observations of the Magnetic Dip and Intensity, I may, I believe, safely state, that the whole of British India has failed to put on record a single good set of experiments to this end. With a view to supply this deficiency for *Madras*, I have availed myself of the loan of a very excellent dipping needle, the property of Captain DRINKWATER, of His Majesty's ship *Conway*; and of two magnetic intensity needles which were brought out by the same officer, and are the property of Captain JAMES CLARKE ROSS, R. N. The dipping needle, which was constructed on purpose for the *Conway*, differs, I believe, in no respect from the ordinary construction, save that it is one of the best instruments I have met with, and, as far as I can see, absolutely faultless. The observations for Dip are as follows.

Observations for Dip made at the Madras Observatory, situated in Long. 5h. 21m. 7s. 8 East of Greenwich, and Lat. 13° 4' 8". 8 N. on the 26th April, 1837.

With Needle marked No. 1.					
Face of Instrument E 2st.					
No.	A.	B.	No.	A.	B.
1	7° 26'	7° 28'	2	6° 16'	6° 14'
3	7 6	7 4	4	6 12	6 8
5 Inverted the axis,	7 24	7 17	6	6 4	6 8
7	7 30	7 24	8	6 16	6 22
Reversed the Poles.					
9	7 28	7 22	10	6 34	6 38
11	7 12	7 7	12	6 16	6 21
13	7 16	7 24	14	6 24	6 28
15	7 26	7 23	91	6 27	6 33
Mean,	7° 21' 0"	7° 18' 37"		6° 18' 37"	6° 21' 30"
Needle marked No. 2.					
1	7 31	7 20	2	7 2	6 38
3	7 31	7 42	4	7 8	6 58
5 Inverted the axis,	7 42	7 25	6	6 55	6 14
7	7 50	7 30	8	6 45	6 55
Reversed the Poles.					
9	7 24	7 6	2	6 0	6 21
11	7 26	7 4	4	6 10	6 28
13	6 34	6 44	6	6 15	6 0
15	6 34	6 43	8	6 23	6 4
Mean,	7 19 0	7 11 45		6 34 45	6 34 45
And taking the general mean, we get the true Dip					
with Needle	No. 1	6 49 56	No.		
ditto ditto	„ 2	6 55 4			
Mean,		6 52 30			

N. B. The numbers 1, 2, 3, &c. exhibit the order in which the observations were made. During the present century, I cannot find that any observations for Dip have been made at *Madras*, but there is one result on record dated 1775, when ABERCROMBIE found it to be $5^{\circ} 15' N.$; if this result can be trusted, it would appear that the Dip is on the increase at the rate of $1' 34''$ in a year.

With regard to the needles employed for the magnetic intensity, it may be necessary to state, that they are constructed after the model of that of Professor HANSTEEN. The needles are cylinders, $2\frac{1}{2}$ inches long and .3 inch in diameter, save that the ends are abruptly sharpened to a point; these needles are freely suspended on their centres by a few filaments of unspun silk, which are hooked on to a brass stirrup, moveable upon the needle; by which means a perfect adjustment to horizontality can be effected; the needle thus suspended is enclosed in a rectangular glass box immediately over a divided circle, from which the arc of vibration can be read off and the number of oscillations counted. The zero of measure here employed, is the time of performing 100 vibrations at a temperature of 60° , commencing with an arc of 20° and ending at from 2° to 4° .—If these measures could be observed to ultimate accuracy, it would be worth while to reduce the times of vibration under these circumstances to the times of describing an infinitely small arc, as has been done by HANSTEEN, and on account of buoyancy, to a vacuum; but since such is not the case, the result will be obtained to all useful accuracy by supposing the correction common to each set of observations, by which the reductions, which are rather operose, are avoided: the reduction to a temperature of 60° is effected by applying the correction, $0,00017 t$. (where t represents the time of performing 100 vibrations);—a formula which is derived from experiment. The two needles used in the following observations are distinguished from one another by a sign \times on one of them. This needle in *London* at a temperature of 60° performed 100 vibrations in 442,76 seconds of mean time, whereas the other needle performed 100 vibrations under the same circumstances in 461,96 seconds; the former needle is further distinguished from the latter from its having been long in use in England, and as having exhibited a remarkable degree of steadiness in its magnetism during the late magnetical experiments instituted in Ireland under the auspices of the British Association; added to which, these needles are calculated to excite a more than ordinary degree of interest from the circumstance of their having been employed by Sir JOHN ROSS in the perilous North Polar Expedition, from which he has lately so fortunately returned. The observations at *Madras* are as follows.

			No. 3, Private mark X.				Mean Int. s.
1837.	Arc.	Ther.	Vib.	Mean Time.		Interv.	
				<i>h.</i>	<i>m.</i>	<i>s.</i>	
April 30th.	20° 0	88.0	1	0	43	49.4	} cor. for temp. 1.43
	12 45	—	101		48	51.3	
	8 15	—	201		53	53.1	
	4 0	—	301		58	54.1	
							300.14
Another set.	20 0	88.0	1	1	1	49.0	} cor. for temp. 1.43
	12 45	—	101		6	51.2	
	8 15	—	201		11	52.6	
	4 15	87.8	301		16	53.8	
							300.17
May 3rd.	20 0	87.0	1	0	45	37.7	} cor. for temp. 1.38
	12 45	—	101		50	40.2	
	8 30	—	201		55	42.1	
	5 0	—	301	1	0	43.6	
							300.59

			No. 3, not marked.				Mean Int. s.
				<i>h.</i>	<i>m.</i>	<i>s.</i>	
April 26th.	20° 0'	85.2	1	3	43	6.1	} cor. for temp. 1.31
	12 30	—	101		48	17.1	
	9 0	—	201		53	27.5	
							309.39
April 30th.	20 0	87.8	1	1	25	17.3	} cor. for temp. 1.40
	11 45	—	101		30	29.4	
	7 30	—	201		35	40.7	
	4 0	87.3	301		40	51.8	
							310.10

or we have for the time of performing 100 vibrations at the temperature of 60° Fahrenheit at *Madras*.

Needle 3, X	Needle 3.
<i>s.</i>	<i>s.</i>
300.14	309.39
.17	310.10
.59	
Mean, 300.30	Mean, 309.74

If *h* and *h'* represent the magnetic intensities at any two places, and *T* and *T'* the times of performing 100 vibrations at those places, then we have

$$\frac{h}{h'} = \left(\frac{T'}{T} \right)^2$$

applying this, the horizontal magnetic intensity for *Madras* (that at *London* being assumed = 1.) becomes

By Needle No. 3, X	<i>s.</i> 2,17.38
Ditto ditto No. 3,	2,24.5

With a view to compare theory with practice, we might now compute the number of oscillations which No. 3 \times ought to make at *Madras* from the observed number in *London*; thus, assuming the Dip for *London* to be $69^{\circ} 10'$ N. the formula becomes

$$\left\{ 3 + \sec.^2 (69^{\circ} 10') \right\}^{\frac{1}{2}} : \left\{ 3 + \sec.^2 (6^{\circ} 52' 30'') \right\}^{\frac{1}{2}} :: \overline{462,76}^2 : T^2$$

performing the computation $T = 344,87$ differing to the amount of 44,57 seconds from the observations. This difference between theory and observation, is but one of many instances which have from time to time occurred in the infant state of a science. Observation has led us to a theory, and then again has shewn the incompleteness of such theory. In the case of Magnetism, we have long since been prepared to expect that local causes might considerably interfere with its established laws; since one station (the island of *Teneriffe*) has already exhibited some singular anomalies, both in respect to the Dip and Intensity. Under these circumstances it is much to be wished that observations could be multiplied in various parts of India, whereby the law of variation from theory may be detected;—and how is this to be accomplished? My answer is ready:—Let any gentleman who is disposed to undertake a set of magnetic intensity experiments signify his intentions; and I shall have great pleasure in forwarding to him, free of expense, a magnetised and compared needle, provided that I am favored with a copy of the results. In anticipation that there will be several gentlemen disposed to forward this inquiry, I am now preparing several needles for use. All that is necessary is, that the person applying for a needle should be in possession of a good clock or chronometer, and has the means of ascertaining its daily rate.

Madras Observatory, 9th May, 1837.

Note.—We shall be most happy to promote the author's views by making a series of experiments with his needles in Calcutta, and then distributing them to friends in the interior. Of the dip we have a few records, (see Proc. As. Soc. for May.) Major B. BLAKE also brought from England an adjusted intensity needle, but we have not yet been favored with his observations.—ED.

VI.—*The Legends of the Saurashtra group of Coins deciphered.* By
JAMES PRINSEP, Sec. As. Soc.

Those who would deprecate the study of old coins as a useless and uninteresting waste of time and ingenuity,—and there are such we fear even among the readers of this journal,—frequently mistake the means

for the end, and suppose us to be enamoured of the very defects of the barbarous specimens of ancient art we seek out with such ardour, rather than give us credit for being impelled by the desire of looking through them at the history of the times they faintly but certainly pourtray. Twice has our small band of collectors been enabled to oppose a triumphant reply to such sceptics even with the unpromising materials of purely Indian relics, without counting the splendid but more natural harvest in ancient *Bactria*. The dynasty of the Guptas in central and eastern India, and that of the Buddhist rājas of *Ceylon*, form two unequivocal lines of history developed, or confirmed, by the unlying evidence of coins. I am now happy in being able to produce a third series for the west of India, equally well filled as to names, and of greater interest than either of the previous discoveries, on several accounts, as will presently be manifest.

I have given the name of *Saurashtra* series to the coins depicted in Plate XLIX. of Vol. IV. because they have principally been found at *Mandivee*, *Puragarh*, *Bhoj*, and other ancient towns in *Cutch*, *Cattywar*, and *Guzerat*, the *Surastrene* of the Greeks, which comprehended from the *Sindh* or *Indus* to *Barugāza* (*Baroach*) on the confines of *Ariake*, or India Proper, and which cannot but be identical with the *Saurashtra*, of Sanskrit authorities*. The specimens before me when engraving the plate alluded to, were not very distinct, and I could not then make out more than a few of the letters, which were seen at once to belong to a peculiar form of ancient Nāgarī.

Success in other quarters brought me back to the promising field of *Saurashtra*, made more promising by the accession of some fresh coins from Mr. WATHEN of *Bombay*, and Captain BURNES, whereon the legends were more complete.

While thus engaged, I received from Captain HARKNESS, Sec. Roy. As. Soc. along with a copy of the Society's Journal, No. VI. (which also contains a notice by Professor WILSON of one coin of this group, but without decipherment†) a couple of beautifully executed plates of a fine collection of these same coins in the possession of Mr. STEUART, who made a tour through India a few years since. The plates appear to have been executed in *Italy*; and as no explanation occurs, I

* See preceding note on the birth place of IXWAKU, page 349.

† Professor WILSON has inadvertently assumed in his note, on my authority, that these coins are known by the name of *Gadhia paisa*, or ass-money. It was not to this description, but to a very degenerate descendant of the Indo-Parthian coinage, generally of copper, that Captain BURNES stated the name to be applied.—(See my former paper, Jour. Vol. III. p. 687.)

presume they have been circulated to the various Oriental Societies in hopes of getting the legends deciphered. Encouraged and aided by this accession of materials, I proceeded, according to the plan that succeeded so well with the Bactro-Pehlevi inscriptions, to separate and analyse the conformable portion or the titles common to all the coins, and afterwards to classify the unconformable portion, which of course would include the proper names.

In this manner I was soon fortunate enough to discover a key to the whole in the value of one or two anomalous looking letters which had hitherto deceived me by their resemblance to members of other ancient Sanskrit alphabets. I must acknowledge some assistance from Mr. WATHEN's Sindhi grammar, where having found the absence of vowel marks in the modern alphabet of the country, I was not unprepared to find the same omission in the more ancient one. Another preparatory step was derived from the TREGGAR legends of last month's plate, ending in *Mitasa*, which I ventured to construe as the corrupted or *Pāli* mode of expressing the Sanskrit possessive case *Mitrasya*. A similar ण was perceived following पुत्र or *putra*, which left little doubt that the word was पुत्रस, for पुत्रस्य "of the son," which, by the idiom of the language, would be the final word of the sentence, and would require all the preceding members of it to be in the genitive case.

The letter ञ (or *j*) occurred in the body of one or two of the legends in its simple state, whereas in the initial word, which could not but be *rāja*, it was prolonged below, shewing that another letter was subjoined, while sometimes the visarga followed it.—This could be nowhere explained but by supposing it the possessive case of राजा, or राज्ञः *rājñeh*, the double letter being not at that early date replaced by a compound symbol.

The same observation will apply to all the other double letters, *mn*, *tr*, *dr*, *sv*, *shv*, which are in this alphabet made by the subjunction of the second letter without diminution. Hence the peculiar elongation of many of the letters, which was at first thought characteristic of the whole alphabet, but it turns out to belong only to the letter *r*, which is thus distinguished from the *n*, *i*, and *h*.

The second word of the title I read कृत्रिमस, for कृत्रिमस्य *Kṛtrimasya*, genitive of *Kṛtrima*; which is translated in WILSON's dictionary "made, factitious, an adopted son (for *Kṛtrima putra*)."—The latter sense was inadmissible, because it so happened that the name of the actual father was in every case inserted, and the same title was also applied to him. The only manner, therefore, in which the term could be rendered was by "elected"—"adopted"—by the people, or by the

feudal chiefs of the country; a designation entirely new in Indian numismatics, and leading to a highly interesting train of reflection, to which I must presently recur. Sometimes the epithet *Mahá* is affixed—not to *rāja*, but to *Kṛtrima*, as *Rāja mahá Kṛtrima*, the ‘great or special elected king’—as if in these cases he had been the unanimous choice of his people, while in the others he was installed merely by the stronger party in the state.

In every instance *but one*, the *rāja* is stated to be the son of a *rāja*; and it is quite natural to expect that a prince, unless he were very unpopular, would have influence to secure the succession in his own family. In the case forming the exception to this rule, the *rāja* is the son of a *Swámin* or *Swámi*, a general term for *bráhmaṇ* or religious person. I have therefore placed him at the head of the line, although it does not follow that in an elective government the regular succession may not have been set aside in favor of an influential commoner.

Among all the coins hitherto examined nine varieties only have been discovered. Of these several can be traced from father to son in regular succession.—Others again spring from the same father, as if brothers had succeeded, in default of heirs direct, or from voluntary supercession; but we know that in Indian families the same names frequently recur in the same order of filiation; so that unless accompanied by a date it is quite impossible to decide whether the individuals are the same in every case of similar names.

The features on the obverse might serve as a guide in many cases, for they (as I have before remarked) are executed with a skill and delicacy quite Grecian; but it will be seen below that I doubt their representing the individual named on the reverse.

I have lithographed in Plate XXIV. the several varieties of legend, as corrected and classified, after careful examination of Mr. STEUART’s plates, with all the coins in our respective cabinets, as well as the sketches I have been favored with of others by Mr. WATHEN. I have not time to engrave the coins themselves, of which indeed the former plate will give a clear idea, for they are all the same in size and appearance, varying a little in the countenance of the prince. Their average weight is about thirty grains, agreeing in this respect with the *korees* mentioned by HAMILTON as struck in *Cutch*, four to a rupee, by the Raos and Jams of *Noanagar*, with Hindu characters*.

Legend, No. 1. Of this there are four examples in Mr. STEUART’s plate. I had one from Mr. WATHEN†, which passed into Captain CUNNINGHAM’s possession by exchange.—Adding the *mátras* or vowels,

* HAMILTON’s *Hindustan*, I. 654. † Found by Captain PRESCOTT in Guzerat.

and correcting the possessive termination, the legend will be in modern character,

राज्ञ कृत्रिमस्य रुद्रसाहस्य स्वामि जनदमपुत्रस्य

Rajna kritrimasya Rudra Sahasya, Swāmi Janadama-putrasya.

in English, ' (coin) of the elected king RUDRA SĀH, son of SWĀMI JANADAMA.' The letter beginning the word *Swāmi* in the majority of Mr. STEUART's figures, is an स्त्र, in lieu of a स्. In one of his, and in mine (or rather Captain PRESCOTT's coin), the orthography is correct. There may be a little doubt about the *n* in *Janadama*, which is rather indistinct, but I think the dot at the foot of the line decisive.

Legend, No. 2. Of this there are likewise four coins engraved. We have none in *Calcutta*. The words run :

राज्ञ कृत्रिमस्य आगदम्न राज्ञ कृत्रिमस्य रुद्रसाह पुत्रस्य

Rajna kritrimasya Agadamna, rajna kritrimasya Rudra Sāh putrasya.

'Of the elected king AGADAMA, son of the elected king RUDRA SĀH.'

The simple title, *rāja*, of the father makes it probable that he is the preceding prince, whose son therefore succeeded him under the same system of election.

Legend, No. 3. Two coins in the STEUART collection :

राज्ञः कृत्रिमस्य वीरदम्नः राज्ञमहा कृत्रिमस्य दमसाहस्य पुत्रस्य

Rajneh kritrimasya Vīra damneh, rajna mahā kritrimasya Dama Sāhasya putrasya.

'Of the elected king VĪRADAMA, son of the great elected king DAMA SĀH.'

In these examples we have the correct orthography of the genitives with one superfluous स्य attached to the penultimate *Sāha*,—which being connected with the word *putrasya* did not grammatically require the affix. DAMA SĀH, the father, is most probably a different person from the AGADAMA of the last coin. His title is more important, though that of his son again falls to the former level. We have as yet no coins of DAMA SĀH himself, though by this happy insertion of the 'fathers' we obtain two names with each specimen.

Legend, No. 4. Four coins in STEUART's plates—none in *Calcutta* :

राज्ञ महाकृत्रिमस्य रुद्रसाहस्य राज्ञः कृत्रिमस्य वीरदम पुत्रस्य

'Of the great elected king RUDRA SĀH, son of the elected king VĪRADAMA.'

Nothing invites remark in the orthography of this legend but the insertion of the visarga in one place and its omission in another. RUDRA SĀH is a direct descendant of the last *rāja*.

Legend, No. 5. Two coins in the STEUART list—two in my cabinet, one in Captain CUNNINGHAM's :

राज्ञः कृत्रिमस्य विश्वासाहस्य राज्ञ महाकृत्रिमस्य रुद्रसाह पुत्रस्य

'Of the elected king VISWA SÁH, son of the great elected king RUDRA SÁH.'

Another regular succession. It is curious that the visarga is not inserted at random, but, where it has been once given, the engraver seems to have considered it necessary to repeat it—as he does also to conform to the modification of the letter *j* in *rāja*.

Legend, No. 6. Three STEUART coins, one PRINSEP (from BURNES' collection), and one in Dr. SWINEY's cabinet :

राज्ञ महाकृत्रिमस्य अत्रिदम राज्ञ महाकृत्रिमस्य रुद्रसाह पुत्रस्य

'Of the great elected king ATRIDAMA, son of the great elected king RUDRA SÁH.'

Here we have, in all probability, a second son of RUDRA SÁH, through failure of heirs male to VISWA SÁH. I write ATRI for euphony as the most likely disposition of the vowels, none being expressed but the initial *a*, which, as in the modern Sindhi, serves for all vowels equally well.

Legend, No. 7. Including Nos. 9 to 12 of the STEUART plate ; two in my cabinet, one in Captain CUNNINGHAM's, and one in Dr. SWINEY's :

राज्ञ कृत्रिमस्य विश्वासाहस्य राज्ञ महाकृत्रिमस्य अत्रिदम पुत्रस्य

'Of the elected king VISWA SÁH, son of the great elected king ATRIDAMA.'

This second VISWA is shorn of his father's distinction, *Mahá*. He does not appear to have left a son to take his place, being in the same predicament (as far as our information goes) as his namesake the son of RUDRA.

Legend, No. 8. Three coins, 25, 26 and 27 of STEUART, and two in my series—one lately received from Mr. WATHEN, and perfect in its circle of letters :

राज्ञ महा कृत्रिमस्य विजय साहस्य राज्ञ महाकृत्रिमस्य दमसाह पुत्रस्य

'Of the great elected king VIJAYA SÁH, son of the great elected king DAMA SÁH.'

This *rāja* is evidently out of place ; being a son of DAMA SAH, he should have come before VI'RADAMA, who had a son. I did not perceive the mistake until after the plate was lithographed.

Legend No. 9. Of this there is only one specimen in the STEUART collection, to which I am able to add two. Col. TOD's plate in the Roy. As. Soc. Trans. contains one. The inscription exceeds all the rest in length :

राज्ञ महकृत्रिमस्य खमिरुद्रसाहस्य राज्ञ महाकृत्रिमस्य खामिरुद्रम पुत्रस्य

Legends on the Cutch coins with the symbol.

- 1 Եւ յամենայն հատումս Եւ յամենայն հատումս
2 Եւ յամենայն հատումս Եւ յամենայն հատումս
3 Եւ յամենայն հատումս Եւ յամենայն հատումս
4 Եւ յամենայն հատումս Եւ յամենայն հատումս
5 Եւ յամենայն հատումս Եւ յամենայն հատումս
6 Եւ յամենայն հատումս Եւ յամենայն հատումս
7 Եւ յամենայն հատումս Եւ յամենայն հատումս
8 Եւ յամենայն հատումս Եւ յամենայն հատումս
9 Եւ յամենայն հատումս Եւ յամենայն հատումս

Legends on the obverse.

5. 707XK11011A.....

8 101.....ΠΟΠΕΥΛΕΙΟ...

9720 in another copy = 1

3 "262 II VII C.....

6 415011K1

7 JOURNAL

Central symbol of the Reverse.

Greek	Sanskrit
Α Α	ह ह ^a
Β Β	घ ^{ar} ^{vo}
Γ Γ	γ γ
Δ Δ	द ^{dh}
Ε Ε	३ ^{gend} ε
Ζ Ζ	न ^s ^N
Η Η	३ ^η
Θ Θ	ॐ ॐ
Ι Ι	३ ३
Κ Κ	† †
Λ Λ	२ २
Μ Μ	χ χ
Ν Ν	३ ३
Ο Ο	ॐ ^o ^o
Π Π	३ ३
Ρ Ρ	३ ३
Σ Σ	३ ३
Τ Τ	३ ३

‘Of the great elected king SWÁMI RUDRA SÁH, son of the great elected king SWÁMI RUDRA DAMA.’

These two names stand insulated from all the rest, and the only test by which we can attempt to supply them with a fit position in the list, is the form of the letter ञ which is decidedly of the earlier model. These two kings may therefore come conveniently into the break after AGADAMA, the second on our list.

We may now proceed to sum them up in the order thus conjecturally determined.

Elected Sovereigns of Cutch, (Saurashtra ?)

1. RUDRA SÁH, son of a private individual, SWÁMI JANADAMA.
2. AGADAMA, his son.

(Here the connection is broken.)

3. SWÁMI RUDRA DAMA.
4. SWÁMI RUDRA SÁH, his son.

(Here the connection is again broken.)

5. DAMA SÁH, of whom no coins are extant.
6. VIJAYA SÁH, his son.
7. VI'RA DAMA, another son of DAMA SÁH.
8. RUDRA SÁH, son of VI'RA.
9. VISWA SÁH, son of RUDRA.
10. ATRIDAMA, also son of RUDRA.
11. VISWA SÁH, son of ATRIDAMA.

Thus we have eleven kings, with only two breaks in the succession, developed by this very interesting series of minute silver coins. Eleven kings, at the usual average of eighteen years per reign, will run through a space of just two centuries. Yet where need we seek for a single trace of such a dynasty in any of the works of the Hindus, when of the Guptas reigning in the central provinces the memory is but faintly shadowed in some of the spurious Puránas? It would be more unnatural to hope for any allusion to a remote kingdom of the west like *Cutch*, in the books of the bráhmans; and unless we can find something to the purpose in the numerous inscriptions from *Girnar* and *Junagarh*, we may, as far as the Hindus are concerned, but have added a barren list of names to the numerous pedigrees already collected by Ton and others, with the advantage however, always considerable, of their being entitled to perfect confidence.

From the Persian historians here and there may be picked up an incidental notice, of great value, regarding the internal affairs of India, but the names are so changed and confounded with titles that it is sometimes hard to recognize them. One of these notices quoted

by Colonel POTTINGER in his history of *Sinde** seems to throw an important light upon the point before us. After noticing the utter absence of any information on the dark age between the Macedonian expedition and the incursions of the Musulmans, this author says—"The native princes are not mentioned by name in all the manuscripts I have perused, until the time of the celebrated KHOOSROO (NOURSHERWAN) king of Persia†, who sent a large army and ravaged the western frontier of SASEE RÁJA's dominions; which are described, *including* his tributaries, to have extended on the north to the present provinces of *Kashmeer* and *Kabool*; southward to *Surat* and the island now called *Diu*; westward along the sea coast to *Mukran*, and eastward to the provinces of *Mérwár*, *Bikaneer*, &c."

Colonel POTTINGER states that the rájas name was SUBEER SINGH; but this may be the learned mode of expanding the original *Sa-See* into a genuine Sanskrit name. He was killed and his country plundered, but after the enemy had retired with their spoil, two princes of the same dynasty succeeded and reigned with great vigour and equity, repairing the forts of *Sehwan*, *Moc*, *Oocha*, *Narain koth*, &c., which had fallen to decay under their peaceful progenitors. The second prince, resigning himself to sensual pleasures, left the conduct of affairs to his minister, during whose illness a young bráhman of his office, named CHUCH, having occasion to visit the king in the seraglio, was seen and loved by the queen, and on the death of the king they married and brought about a revolution which placed him on the throne. "Such," says the historian, "was the close of the race of Rája SASEE, which had governed the kingdoms of *Sinde* for upwards of two thousand years; whose princes at one period received tribute from eleven dependent kingdoms, and who had set the threats of the greatest monarchs of the world at defiance."

Now the word *Sasee*, the general name of the royal line, has a much greater affinity with *Sáha* (genitive, *Sáhasa*) than with SUBEER SINGH—and this name we find borne by seven out of the eleven princes whose names have been thus fortunately preserved. Many other considerations might be adduced in favor of their identity. A commercial maritime kingdom seated in *Saurashtra* and at the mouth of the *Indus*, would naturally extend its sway up the valley of that river and its branches. From its wealth and liberal form of government, it would be stable and powerful, especially under a tributary treaty (in general

* POTTINGER'S *Travels in Beloochistan*, p. 386.

† NOURSHERWAN flourished about the middle of the sixth century. He was contemporary with the Roman Emperors JUSTINIAN and JUSTIN.

punctually performed) with the great monarch of *Persia*, the chief enemy capable of doing it injury. The antiquity assigned to this Sindian, or early Indian kingdom, further agrees with the tradition of *IKSWAKU*'s residence, and the migration of his sons eastward, and with all we have remarked (in a previous paper) regarding the origin of the commercial classes throughout modern India.

But, if the dynasty of the *Sáha* or *Sasee* rajas, of which we may now fix the termination towards the close of the sixth century, extended backwards for two thousand years or even a quarter of that period, we should find some mention of it by *ALEXANDER*'s historian, or by his namesake the commercial *ARRIAN*, who visited this very kingdom in the second century of our era. The elder *ARRIAN* affords but little to aid us. In the descent of the *Indus*, some petty chiefs, as *MUSICANUS*, *OXYKANUS* and *SAMBUS* are encountered and overthrown; but we hear of no paramount sovereign in *Patalene*. Indeed from the pains taken in rendering *Pattala* more habitable by digging wells, and inviting back the fleeing population, it might be argued that it could not have been a place of much importance prior to *ALEXANDER*'s visit.

The capital of the province had changed in the second *ARRIAN*'s time, to *Minágara*, "the residence of a sovereign, whose power extended as far as *Barugáza* in *Guzerat*. The government was in the hands of a tribe of Parthians divided into two parties; each party as it prevailed chose a king out of its own body, and drove out the king of the opposite faction: συνεχῶς ἀλλήλους ἐκδικόντων*."

Dr. VINCENT, the learned commentator on the *Periplus*, seems to hesitate in believing this assertion of *ARRIAN* that the government of the *Sindh*, *Cutch* and *Guzerat* province, was in the hands of a tribe of the Parthians, "Βασιλεύεται δὲ ὑπὸ Παρθων—" "If," says this author, "the governing power were Parthians, the distance is very great for them to arrive at the *Indus*; may we not, by the assistance of imagination, suppose them to have been Affghans, whose inroads into India have been frequent in all ages. That the government was not Hindu is manifest, and any tribe from the west might be confounded with Parthians. If we suppose them to be Affghans, this is a primary conquest of that nation, extending from the *Indus* to *Guzerat*, very similar to the invasions of *MAHMUD* the Ghaznavide†."—"If" (we may here continue) for Affghans in this passage, we substitute the Mithraic races of *Seistán* and *Ghazni*, by whatever name they were known at the time, we find confirmation of such a line of invasion both in *Mr. MASSON*'s remarks—in our Indo-Sassanian coins, and in *ARRIAN*; for the fire worship would

* *VINCENT*, *Periplus* of the Erythrean sea, II. 385. † *Periplus*, II. 585.

be quite ground enough for his classing the ruling race under the general term of Parthian*.

At any rate, as our author says, the ruling power was not then Hindu; and therefore the dynasty of the *Sáhas*, in which we find the genuine Hindu names of *Rudra*, *Viswa*, *Vira* and *Vijaya* could not yet have sprung up. Thus we have a limit on either side, between the third and the seventh century to assign to them, and we have names enough to occupy one half of that space. The family name of *SÁH*, or *SÁHU*, is not Sanskrit†, but it is very extensively used in the vernacular dialects. Half of the mahájans of *Benares* are named *Sah†*, and the epithet evidently implies 'merchants,' for we find the same root in the *sahukár* (soucar) agent; *souda*, *soudágar*, trade, trader; and perhaps in the Persian word *sood*, interest. One branch of this western tribe *Sáh§* has been elevated to royalty in the present occupants of the throne of *Nipal*: the *Garkhális*, who overturned the *Malla* line in 1768, having confessedly migrated from *Udayapúr* close upon the borders of our supposed Sindian kingdom, and settled in the hilly district of *Kemaon* about two centuries anterior to their conquest of *Nèpal Proper*.

The learned memoir of Professor LASSEN on the Pentapotamia furnishes us with a proof that the *Sáhs* of *Sinde* and *Guzerat* were well known at the time the seventh chapter of the *Mahábhárata* was written for, when describing with all the acrimony of those who had suffered from their aggressions, the origin and habits of the *Bahlics* or *Bactrians* of the *Panjáb* or *Panchanada*, in the 44th verse we find the following words put into the mouth of *CARNA*:

* By *Parthians*, according to *MOSES* of *Chorene*, should be understood the *Palharis*, or *Balharis*, or people of *Pahla*, *Balha* or *Balcha*, the *Balika* or *Bahika* of the Sanskrit, and the *Bactria* of the Greeks: whence were derived the *Pehlevi* dynasty and *Pehlevi* writing of Persia; and the *Palhawans* of their more ancient poetry. An explanation so comprehensive and simple, that it seems curious it should ever have been disputed by the learned. Is it not also highly probable that the *Balabhí* kings, and their capital the *Balabhipura* of *Gujerat*, should originally have referred to a *Pahlavi* dynasty holding or re-establishing their sway in this province? The Sanskrit name of the town according to *TOD* is *Balika-pura*, and of the kings, *Balika-rai*. We must find their coins and decipher their inscriptions ere we shall be competent to enter more fully on the subject.

† स॒ह or स॒हदे॒व *Saha deva* is however the name of the youngest of the five *Pándava* princes, and might be accepted by some etymologists as the original of a patronymic, *Sáhu*. स॒ह also signifies "increase, addition;" but सा॒धु is generally looked upon as the root of *Sáhu* the mercantile name.

‡ GOPAL DAS SAH, GOAL DAS SAH, &c. &c.

§ I perceive also in a manuscript just received from Captain SLEEMAN, that the *Sáhs* frequently reigned at *Garha Mandela*.

Sáhs of *Sinde* must be very old, or the passages of abuse and praise in these poems must yield their claim to high antiquity. At any rate a departure from strict orthodoxy is established against the tribe.

There are some other points in the reverse legend of the coins before us that call for further explanation—first, of the word *Kritrima*. The expression quoted above from ARRIAN indicates something of an elective government even while the Parthians ruled at *Minagara*; each party as it acquired the ascendancy in the politics of the state ‘*choosing a king out of its own body*.’

Dr. VINCENT supposes that the contending parties (the whigs and tories of their day) were not both Parthians, but more probably Parthian and Indian. This view is not a little supported by the coin evidence, and it is only necessary to imagine that the native influence of a rich mercantile aristocracy at length prevailed and excluded the Parthians altogether. Of these *Parthians* we see the remnant in the Parsees so numerous located in *Guzerat* and *Surat*, and can easily imagine, from their numbers and commercial enterprize, that they must have been formidable rivals to the indigenous merchant-kings.

Something of this feudal system of government is visible to this day in the fraternity of the *járajahs* or chiefs of *Cattywar* and *Cutch*. The name *járájah* might, without any unwarrantable license, be deduced from *sah-rája*, persianized to *ja-rája* or local chieftain. In 1809 there were twenty or more of these chiefs in *Cutch* alone able to furnish a contingent of from two hundred to one thousand men*. In the *Guzerat* peninsula the number must be much greater, since in 1807 there were estimated to be five thousand two hundred families in which the inhuman custom of female infanticide was regarded as a dignified distinction of their caste!

In the names of these modern chieftains we can trace a few of our list *atra*, *visa*, and *vira*: and a town called *Damanagar*, may have owed its foundation to our prince of that name. The *Jah-rájahs* and *Catties* call themselves Hindus, but are very superficially acquainted with the doctrines of their faith—the real objects of their worship are the Sun and the *Matha Assapurí*† the goddess of nature,—doubtless the *Nanaia* of more classical *Bactria*. They are said to impress the Solar image on every written document. We are accordingly prepared to find it on their ancient coinage, where it is seen on the right hand side, the moon (*matha* for *más* or *máh*) being always in company on the left.

* HAMILTON'S Hindostan, I. 587.

† Ditto, I. 637.

The central symbol I have had to explain so often and with so many modifications, that I really feel it becomes more of an enigma the more is said of it! It occurs on the Pantaleon Greek coins—on the Indo-Scythic group—on the Behat Buddhist group—on similar coins dug up in *Ceylon*—and here at the opposite extremity of India. It is the Buddhist *Chaitya*, the Mithraic flame,—mount Meru, mount Aboo!—in fact, it is as yet unintelligible and the less said of it, the sooner unsaid when the enigma shall be happily solved!

Legend of the obverse.

Having satisfactorily made out the contents of the inscription on the reverse of the *Saurashtra* coins, I might have hoped to be equally successful with the obverse; but here I must confess myself quite foiled. From the obverse die being somewhat larger than the other, it seldom happens that a perfect legend can be met with; and by placing together all the scraps from different samples, enough only can be restored to shew: 1st, its general character; 2nd, to prove that *it is not Sanskrit*; and 3rd, that it contains two distinct styles of letter on the opposite sides of the head; that on the right having a strong resemblance to Greek, the other a fainter to Pehlevi; but both written by an ignorant hand. The three or four Pehlevi letters are variable and quite illegible; but the others, by combining the two first examples in the plate, (No. 5, from my coin; 8, from Mr. STEUART,) might be read *vonones vasileus*, allowing sufficient latitude for the corruption of a century or two. Should my conjecture be admitted even to the extent that the letters are Greek, we may safely attribute their presence to the supremacy of the Arsacidan king of Persia, or, looking farther back, to the offsets of the Bactrian kingdom in the valley of the *Indus*, where the Greek characters were still retained, as proved by the coins of KODES and NONES, (or *Vonones*) AZES, &c.; and we may conclude that his portrait, and not that of the tributary *rāja*, was allowed to grace the coinage of *Saurashtra*.

The sway of DEMETRIUS we know from STRABO to have extended over the delta of the *Indus*, and the retrenchment of a single particle from his text would make it include *Saurashtra* also. Speaking of MENANDER'S Indian possessions he says:

“Εἶγε καὶ τὸν Ὑπανν (Ὑπασιν) διέβη πρὸς ἑω καὶ μέχρι τοῦ Ἰσαμου (Ἰωμάνου) προῆλθε. ταῦτ' ἐν γὰρ αὐτῷ, ταδε Δημήτριος Ἐυθυδήμου υἱὸς τοῦ Βακτρίων βασιλέως οὐ μόνον δε Πατταληνὴν κατεσχον, ἀλλὰ καὶ τῆς ἄλλης παραλίας τήν τε Τεσσαρίστου καλουμένην καὶ τὴν Σιγέρτιδος βασιλειαν.

On this important passage many have been the opinions expressed by the learned. BAYER refers the third name (the first two being fixed

as the *Hyphasis* and *Jumna*) to the mouths of the Ganges : “quam Strabo, alteram oram maritimam nomine Τεσσαριостου dicit ? nempe nullam potuit, nisi quæ ad Gangis fluminis ostia ubi et Σιγέρτιδος regnum.” M. LASSEN, from whose *Pentapotamia* I have cited the above extract, thinks that the word merely alludes to the coasts in the neighbourhood of *Pattalene*, and he identifies *Sigertis* with the Sanskrit *Trigertá* त्रिगर्ता in the province of *Lahore*. MANNERS places the former in *Guzerat* : “ad oram maritimam, quæ hodie *Guzerat*, olim nomine Sanskrit गुर्जारा (*Gurjára*) appellata est, τεσσαριостου regionem refert Mannertus, quod at veritatem haud dubie proxime accedit, sed nil certius de hoc nomine invenio*.”

Now by abstracting, as I said before, the twice repeated particle, τε, or by changing τεs, to the article του or της, the whole obscurity of the text disappears, and the βασιλεια της Σαριοστου καλουμένη stands forth as the maritime kingdom of *Saurashtra*. This interpretation is surely more natural than the extension of MENANDER's rule to the extreme east of India, merely to find another maritime delta and port for the græco-latinized corruption of a name quasi *Tessariostia* !

But we dare not venture on any speculations in regard to Greek names or affairs, lest we undergo castigation from the *Hellénic* critics of Paris, who are surprised at our ignorance of authors, ancient and modern, Greek and German, whose works we regret to say have never yet visited the banks of the Ganges ! We ‘Indianistes’ must then leave this investigation to M. RAOUL DE ROCHETTE as being altogether, to use his own words, “hors du departement de nos etudes !”

There are still two series of *Saurashtra* coins to be examined, but I have not yet wholly succeeded in deciphering them, and my readers will doubtless rejoice at such an excuse for postponing their discussion : I cannot, however, let pass the present opportunity of mentioning, as a highly curious circumstance, the very great similarity between the old Sanskrit and the Greek character. Their striking uniformity becomes more palpable the farther we retire into antiquity, the older the monuments we have to decipher ; so that even now, while we are quite green in the study, we might almost dare to advance (with the fear of M. RAOUL DE ROCHETTE before us), that the oldest Greek (that written like the Phœnician from right to left) was nothing more than Sanskrit turned topsy turvy ! A startling proposition this for those who have so long implicitly believed in *Cadmus*, and the introduction from *Egypt* of what, perchance, never existed there. Yet there is nothing very new nor very unnatural in the

* De Pentapotamia Indica Commentatio, C. LASSENII, 51.

hypothesis ; since the connection of the Greek with the Phœnician and Samaritan alphabets, has been admitted as a strong evidence that “ the use of letters travelled progressively from *Chaldea* to *Phanicia* and thence along the coasts of the *Mediterranean**.” and the Greek language is now so indisputably proved to be but a branch of the Sanskrit stem, that it is not likely it should have separated from its parent without carrying away some germs of the art of writing, already perhaps brought to perfection by the followers of BRAHMA. But my arguments are not those of books, or learning, or even tradition, but solely of graphic similitude, and ocular evidence.

The Greek letters are dressed by a line at the foot, in most cases, as A, Δ, Λ, M, Ω, T, &c. ;—the Devanāgrī are made even along the upper surface of the letters, and in later ages a straight line has been introduced at the top, from which the grammatic elements are suspended. The Greek alphabet is devoid of all system and has had additions made to it at various times. Some of these, as ϕ, χ, ψ, Ω, are precisely those which present the least resemblance to the Sanskrit forms.

I have placed my evidence at the bottom of plate XXIV. taking my Greek type from the well-formed letters on coins, and from the boustrophedon tablet of Sigeum.

Of the vowels, A, I, O, and r, present a striking conformity with the vowels अ, इ, and the semivowels व and य of the oldest Sanskrit alphabets inverted. The vowel E is unconformable, and resembles more the short ε of the Zend. The long H is a later introduction and appears to be merely the iteration of the short vowel I, as ω is of OO.

In the consonants, we find B, Γ, Δ, Z, Θ, K, Λ, M, N, Π, P, Σ, T, in fact every one of the letters, excepting those of after invention, are represented with considerable exactness by the ब (or double व्व), ग, घ, च, य, क, छ, झ, न, प, र, ज, त of the oldest Sanskrit alphabet, although there is hardly a shadow of resemblance between any pair in their modern forms. The same precision cannot be expected in every case ; the B, Δ, Θ, Λ, M, N, Π, P, T, require, like the vowels, to be viewed in an inverted position : the Γ, and Σ, remain unturned : the Z, and K require to be partially turned.—The Λ and the N may be deemed a little far-fetched ; the B taken from the double v, and the Δ from the aspirated च may also be objected to ; but taking a comprehensive view of the whole, it seems to me impossible that so constant and so close a conformity of the alphabetical symbols of two distant nations should exist without affording demonstration of a common origin. Whether the priority is to be conceded to the Greeks,

* Pantographia, page 107.

the Pelasgians, or the Hindus, is a question requiring great research, and not less impartiality, to determine. The palæography of India is now becoming daily a more interesting and important study, and it cannot fail to elicit disclosures hitherto unexpected on the connection between the European and Asiatic alphabets.

VIII.—*On the Properties ascribed in Native medical works to the Acacia Arabica.* By LEWIS DA COSTA, Esq.

At a time when the intended formation of a Pharmacopeia for India has been publicly announced by the new Medical College, it is a desideratum to know how the natives have treated the subject of medicaments,—what of good their books contain,—what of error. Our medical practice pays perhaps too little attention to vegetable remedies, of which the Orientals possess an infinite variety, many inert, but many active, and many also quite unknown to Europeans. I had some intention of publishing a translation of the *Mukhzun ool udveeyuh* by MOOHUMUD KHOSRU KHÁN, but there is no encouragement for such an undertaking in India. I therefore think it the wiser course in the first instance to publish a specimen by which the pharmacopeist will be able to judge of the aid he might derive were the whole work (collated with others) placed before him in an English translation. I use the *Gilchrist* orthography.

أم عنيلان OOMMEGHEELAN, ACACIA ARABICA, commonly called *Tuleh* شوكه مصر The people of the desert name it *Shuokeh-i-Misr* طامع (Egyptian thorn), and *Shuokeh-i-Arabia* شوكه اعرابيه (Arabian thorn). In Persian it is called *Moogheelan* مغيلان; and in Hindee, *Keekur* كيكور and *Bubool* ببول.

A thorny plant, generally growing in forests and at the foot of mountains. It is of two kinds, large and small, both resembling each other in appearance and foliage. The *first* kind is smaller than an apple tree, and the branches covered with thorns; the trunk is hard and at first green tending to white, but as it advances in age it assumes a blackish hue resembling the ebony آبنوس but tinged with red. The fruit, which is like a bean or bean pod, resembles *Baqla* باقلا and *Khurnoob* خرنوب (*Phaseolus vulgaris* and *Carobs*), and is flat, and knotty; the knots vary from five to nine in each bean, and within each knot resides a seed in appearance like *Turmis* ترمس (Egyptian Lupin), but flatter and of a red color. The bean is variously called *Quruz* قرظ, *Sunt* صنط, *Ghurub* غرب and *Usnat* عصنادة. The pressed juice is called *Uqagia* اقاقيا (*Acacia*). The gum of a red and yellow semi-transparent color is called *Sumugh-*

i. Urbee صمغ عربي (Gum Arabic). It is said that between the bark and the body a resinous substance is found resembling the gum, but which is not gum; when this substance is freed of a red fluid that resides in it and washed, it becomes very white, and when chewed like the *Ilk* علك (gum resembling mastich), it discharges an odoriferous liquid and leaves an agreeable smell in the mouth.

The second kind, called *Sulum* سلام by the Arabs, is less thorny, and sometimes has no thorn at all, and the branches are very profuse; the trunk is blacker than the first kind. The fruit, which is like a bean and called *Quruz* قورظ is not knotty; it contains from 9 to 31 flat seeds according to size, and is of a deep violet color. Between each seed and around it a white coating is seen and between this coating and the shell is lodged a mucilagenous and gummy fluid of a deep yellow color. The blossoms of both the kinds are of a yellow color and globular form, emitting an odoriferous scent. The leaves of both the kinds are, in size and profusion, alike, and grow from a thin fibre by pairs in an oblique direction, and are astringent to the taste. There grows in some places a *third* kind of this plant, the branches of which are full of knots.

Character of all the parts. Cold and dry in the 2nd degree.

Medical Properties. Binding (restraining the discharge of redundant matter) and repellant. A drink prepared of the juice of its blossoms is good for the cure of palpitation from heat, and the horror, and for strengthening internal organs, either taken by itself or with other proper medicine. The leaves are deobstruent (opener of obstructions) and good for the stoppage of diarrhœa. If fused by way of embrocation it strengthens laxated members. The tender green leaves if steeped over night in water and exposed to the influence of the moon, and the clear water taken off and drank in the morning, will cure excoriation of the urinary duct and allay the smarting of urine (ardor urinæ). A powder prepared of equal parts of the bark, the leaves, the blossoms and the gum, and from $\frac{1}{2}$ a drachm to 1 drachm taken regularly every morning, will thicken and retard the semen, prevent involuntary discharge, &c. The young leaves with a little white cummin seed, and one or two buds of pomegranate bruised and steeped in water, and strained and heated, and a few (6 or 7) pebbles or shards well heated and cooled in it (4 or 5 times), will prepare a liquid to prevent looseness in children in the last stage of teething, which is a very trying and weakening season with them; this might also be given to adults with good effect—the quantity to be regulated according to strength and age.—A plaster prepared of green leaves is good to fill up wounds and subside inflammation. A decoction made of the leaves is given for the protusion of the anus and for drying the humidity of the womb. Pressed juice of the leaves and fruit stops the flowing and spitting of blood. The fruit boiled in water, and a piece of cloth soaked in it several times will make a good Pessary. Of the beans a cerement is thus made—split the beans and take the seeds out; rub briskly the inner part of the bean upon a piece of new cloth, until the pulp and all the humidity is thoroughly absorbed in the cloth, which when dried will become like cerement; of this cerement stays are made and worn by women for several days on their bosom to brace up and tighten fallen and slackened breasts. Bark of the trunk and of

the branches is used for the stoppage of blood from fresh wounds. This forms the principal ingredient of the oil of *Shekh Sunnan*. The bark of the tree bruised and steeped in ten times the quantity of water and kept for two days, and then boiled and the liquid reduced to one half the quantity, and then strained off after rubbing the bark well in it, and kept in a china or a glass vessel, will make an excellent wash for women to use during menstruation after urine—it serves to contract the vagina considerably. The fruit, leaves and bark are good for tanning leather in lieu of *Mazoo* مازو (gall-apple). The bark and blossoms are principal ingredients in making molasses, and spirituous liquor of the same.

The root and the bark are detergent. They make a good dentifrice for strengthening the gums لثة. A brush made of the thin sprigs is used for strengthening the teeth. The wood is used, in consequence of its extreme hardness and solidity, in making wheels for carriages, and instruments for tillage and tent pins. There is another kind of *Oommigheelan*, of which the leaves, fruit, color and bark resemble the 2nd kind, but it has a very bad odour, and has great abundance of blossoms. This kind, which generally grows in Bengal, is brought to no kind of medical use whatever: the filament of its root, however, if taken to a snake, will cause it to drop its head and make it languid.

Remarks. By the European physicians the gum is only used. They say “that gum exerts no action on the living system; but is a simple demulcent, serving to lubricate abraded surfaces, and involve acrid matters in the primæ viæ. In the solid form it is scarcely ever given unless to sheathe the fauces, and allay the trickling irritation which occasions the cough in catarrh and phthisis pulmonalis; in which case a piece of it is allowed to dissolve slowly in the mouth. It is chiefly used in the state of mucilage.—*London Dispensatory*.

اقوقيا AQAQIA. A name given to the pressed juice of *Quruz* قرظ and *Quruz* is the fruit of the *Tuleh* تلم, from which the Gum Arabic is obtained. This plant in Hindí is called *Keekur* كيكور, and the pressed juice of the fruit *Keekur ka rus* كيكوركارس. By the Franks or Europeans it is called *Acacia*.

Quality. That obtained from unripe fruit previous to its drying, is of a red ruby color; and when dried, it assumes a greenish hue mixed with red and black. That obtained from fruit after it is ripe, is of a black color. The former kind is always chosen for medicinal purposes; it has an agreeable smell, of a mixture of green and black color, and is weighty and hard.

Character. When unwashed cold in 1st, and dry in the 1st and 3rd degrees. When washed cold and dry in the 2nd degree.

Medical properties. Drying, repelling, and binding رادع قابض. It stops flow of blood from any part of the body نزع الدم; also from the mouth, نفث الدم. It strengthens the stomach معدة and the liver كبده, and prevents the flow of humours (by the nose) arising from heat نزلات حارة and the dysentery اسهال. It is good, both internally and externally, in cases of

languor of the anus and of the womb **استرخاء معدة ورحم**. As ointment it allays inflammation of the ophthalmia, strengthens the sight **بصر**, attenuates the humours, and removes redness. It is introduced in medicines for the cataract **ظفرة**. If applied as ointment to inflammations arising from heat **اورام هارا**, it attenuates and prevents the determination of the humours in that direction. It is good for the whitlow **ناخس**, for the cracking of the skin from cold, for the relaxation or weakness of the joints, and for the protrusion **فروج** of the navel of children and the anus : and if applied to the hair, it gives a fine black color ; if used with myrtle leaves **برگ مورک** and red rose **گل سرخ**, it prevents flow of perspiration **ادرار عرق**, and removes its bad odour : applied to the body and the face (as a cosmetic), it improves the color of the skin ; with albumen ovi (white of egg), it is good for buras by fire, and prevents blistering ; with *Momeroghun* **موم روغن** (an ointment of thick consistence made of different ingredients and bee's wax), called in Arabic **قيدروطي**, it is also good for burns by fire and for the whitlow. If used as powder, it is efficacious in preventing flow of blood from any part of the body : if boiled in water, and the liquid used as an embrocation on wearied or languid parts, it will strengthen and prevent the determination of the humours that way. Used as a clyster, it alleviates the excoriation of the intestines **سحج**, and prevents flux with occasional issue of blood **اختلاف الدم**, and strengthens the intestines **امعا**. If used as an injection **اختعان** to the womb, it absorbs **نشف** morbid secretions **رطوبات** : applied as pessary and suppository, it prevents the flowing of blood, the protrusion of the anus and the womb, **رحم** its languor and humidity (flowing of watery humour). As plaster **غماد** it is good for the protrusion of the pupil of the eye **برآمدگی حدقه**, for inflammations arising from heat and erysipelas **مرخ باد** or **باد سرخ** (ignis sacer or St. Anthony's fire) ; also inflammation of the anus and the womb, and it strengthens weakness of the liver : a solution of it in water preserves the hair and blackens it. Used with the Gumherb ladon **لادن** and oil of roses **روغن گل**, it is efficacious in stopping looseness in children. It creates obstructions **سد**. Its *corrector* is almond oil **روغن بادام** *Dose* up to 1 *dirhem*. *Succedanea* are lintel **سدس** and sandal-wood **صندل** same quantity as the *Aqagia*. Some say the best is the juice of the box-thorn **حوض**, in Hindi called **رسوت**.

Aqagia is thus obtained :—Take the fruit of the tree when ripe, bruise, clean, (percolate ?) and hoil it on an easy fire until it obtains a thick consistence, approaching to congelation, when pour it into moulds, and when settled it is fit for use. Some introduce into it the juice of the leaves likewise. Some say that

of the congelation is effected under the sun it is the best. The best method of washing it is thus: Rub it well in water, and take that which gathers on the surface and make lozenges of it.

It is worthy of knowing that *Aqagia* is a compound of two essences, *Luteef لطيف* and *Kuseef كشيف* the finer and the grosser particles; the former is burning, sharp, acrid, and penetrating حارحادذاع غايص, and the latter earthy, costive, and obstructive ارضي قابض مسدد. When *Aqagia* is washed, the finer particles evaporate, and the grosser or earthy particles remain; consequently on some occasions, such as inflammations, the unwashed is used, and on other occasions, such as the diseases of the eye, the washed is used.

Remarks. Egyptian thorn, *Acacia*, *Mimosa Nilotica*, exudes white Gum Arabic. Juice of its pods is made into *Acacia vera*.

Acacia. The juice expressed from the pods of *Mimosa Nilotica*, inspissated to dryness.—*Gray's Supplement to the Pharmacopeia.*

سومغ عربي SUMUGH or SUMGH, Arabic; *Fooqemunoon*, Greek; *Qamooz*, Syriac; *Deenoon*, Roomee; *Ard*, Persian; *Uzdo*, Sheerazæ; *Gond*, Hindî; *Gum*, English.

A fluid matter which exudes from the body of certain trees, and concretes and dries up. The gum of each plant is described under that plant. By the word صمغ Gum without any epithet is meant Gum Arabic, which is obtained from the *Oommegeelan* (*Moogheelan*) plant. The best is of a light yellow color, clear, transparent and bright صاف شفاف براق; and when put in water and allowed to rest in it for some time, it will not swell but completely dissolve, leaving no residuum whatever; a piece held in the mouth produces the same effect as the above.

Character. Hot in a temperate degree, and dry in the 2nd degree. *Jaleenoo* (*Galen*) says, hot in the 2nd degree.

Medical properties. It is viscous and demulcent ملايين i. e. soothing the chest, and is binding قابض. It (gives tone) strengthens the stomach and the intestines and preserves the bones; prevents defluxion on the chest, cough, صرفه and excoriation of the lungs, or peripneumony قروح ریه and harshness or soreness of the throat خشونت حلق and the windpipe قصبة ریه وسینه, it clears the voice, and prevents the determination of morbid humours to the chest انصباب مواد نزلی برسینه. If a piece of it be held in the mouth and suffered to dissolve gradually, or if it be taken in pills, or some proper medicines it assists expectoration نغث. From 2 to 3 *misqals*, it is efficacious in diarrhoea and abrasion of the intestines. Fried in oil of roses, it is good for sanguinary discharges from all parts of the body, excepting from the womb, and in piles بواسير. It stops diarrhoea. If 1 *misqal* of the gum, well ground and mixed in 1 *ougeah* of fresh cow's butter, be taken daily for three or seven days it will effectually stop flow of blood from the mouth, the chest, the lungs, and from all other

internal organs *أعضاء داخلية* excepting from the womb, and in piles. If taken with fresh goat's milk, it will have the same effect. With white of eggs (*albumen ovi*), it is good for burns by fire: a solution of it with rose-water dropped *قطر* into the eyes affected with the ophthalmia, *Sulq* سلاق cutaneous eruptions in the eye-lids, and *Jurb* جرب itching, is highly beneficial in removing those complaints. It is injurious to excrementary discharges. Its corrector *مصلح* is *Kuseera* كسيرا gum tragacanth, and (it is said) rose-water and sandal-wood. Its succedaneum *بدل* is almond gum *صمغ بادام* and myrtle seed *حب الاس*.
 —*Mukhzun-ool Udweeyuh*, by *Moohummud Khasroo Khán*.

IX.—Proceedings of the Asiatic Society.

Wednesday Evening, the 7th June, 1837.

The Hon'ble Sir EDWARD RYAN, President, in the chair.

Dr. J. SWINEY, Lieut. M. KITTOE, Professor O'SHAUGHNESSY, G. W. BACON, and FRANCIS ROBINSON, Esqs. were elected Members of the Society.

Mr. MUIR was proposed by Dr. FALCONER, seconded by the Secretary.

M. F. EYDOUX, Chev. Leg. Hon., Naturalist of the *Bonite* Corvette, solicited through Professor GOODEVE, the honor of being chosen a corresponding Member. Referred to the Committee of Papers.

The following reply from Government was received to the reference regarding the MACKENZIE MSS.

TO JAMES PRINSEP, Esq.

Secretary to the Asiatic Society.

SIR,

With reference to your letter, dated 10th September, 1836, I am directed to transmit to you the accompanying copy of a communication from the Government of Fort St. George, and to state for the information of the Asiatic Society, that the Right Honorable the Governor General of India in Council, has authorized the Government of Fort St. George to expend a sum not exceeding 7,000 rupees, in order to obtain from the Rev. Mr. TAYLOR an examination and collation of the manuscript works in the vernacular languages of India, collected by the late Colonel MACKENZIE, and the restoration of any that may be found to deserve it.

I am, Sir,

Your obedient servant,

H. T. PRINSEP,

Secy. to Govt.

Council Chamber, }
 10th May, 1837. }

Mr. TAYLOR estimates, that the preliminary collation and examination of the manuscripts, including the restoration and copying of those injured, decayed, or becoming illegible, as may appear desirable on investigation, may occupy about a year; and half a year more is allotted for those at *Calcutta**. Of the whole he is to give an analysis, whence it will be determined what shall be translated or published in original. He ventures to anticipate "some results from the enlightened recommendation of the Asiatic Society, that will justify their decision to the literary world, and furnish an important addition to our knowledge of history, mythology, philosophy, ethics, and local customs, modes of thinking and other habits of the people of South India."

A letter from the Secretary of the Asiatic Society of Paris, M. E. BURNOURF, communicating officially the grant of 1,500 francs per annum, for the

* We have none of the Tamul or Telinga MSS. in our library.

purchase of Sanskrit MSS. on account of the French Government, and requesting the Calcutta Society to undertake the commission.

The following letter from Capt. HARKNESS, Sec. Roy. As. Soc. of London was read.

*Royal Asiatic Society's House, 14, Grafton Street, Bond Street,
London, 24th January, 1837.*

SIR,

I have the pleasure to acknowledge the receipt of your letter of the 6th of June last, enclosing a bill on Messrs. MORRIS and Co. for £31 10s. the amount of your Society's subscription to the Oriental Translation Fund up to the year 1835, inclusive.

With reference to the last paragraph of your letter, I am requested to say that, as a body, the Oriental Translation Committee is precluded from taking any portion of the Oriental works (texts) you are now publishing; as it could not, consistently, with the objects of its institution, present them to its subscribers. Several of the Members, however, have expressed their intention of becoming, individually, subscribers to each edition, as completed; and I hope, also, to obtain a few subscribers from among the Members of the Royal Asiatic Society. In the meanwhile I trust that the powerful advocacy which the cause received in this country has been, long ere this, productive of much benefit. It was supported by the united influence and exertions of the Royal Asiatic Society, and the Oriental Translation Committee; and the result was confidently understood to be, that the Bengal Government was to be instructed, at least, to defray all the expense attending the publishing of the works which it had commenced to print, but which it had transferred to your Society to complete.

I have the honor to be, Sir,

Your most obedient humble servant,

Oriental Translation Committee.

H. HARKNESS, *Secretary.*

The Secretary observed, that

Captain HARKNESS' letter was the first official notice the Society had received from London of the fate of their memorial, regarding Oriental publications, sent home through the Government here, and in duplicate through the Royal Asiatic Society, in 1835. It appeared that, from motives of delicacy, the Council of the Royal Asiatic Society thought it right not to publish what had been done in the Annual Review of its proceedings, while the subject was still under consideration; but that the favorable result of the application to the Court of Directors being now generally known, they ventured to announce the success of their intercession. He thought, therefore, that it behoved the Society to notice the information they had long since possessed through the private correspondence of their English agent.

The deputation appointed by the Royal Asiatic Society to wait upon the Chairman, and Deputy Chairman, and upon the President of the Board of Control, consisted of the Right Honorable C. W. W. WYNN, President, Sir GORE OUSELEY, Sir A. JOHNSTON, Sir G. STAUNTON, Vice-Presidents, and Professor WILSON. Mr. WYNN opened the interview in both instances, and stated the case very clearly and sensibly, going into the general question—the impolicy of setting aside the native literature and institutions, and dwelling particularly on the assistance sought for the abandoned Oriental publications. Professor WILSON also delivered a long address (the substance of which was published in the form of two essays in the London Asiatic Journal). Sir GORE OUSELEY, and Sir A. JOHNSTON, followed; and the high authorities replied in set speeches, expressing a disposition to favor the application without any pledge to the line that the Court or the Board would pursue. The Court's reply was understood to be delayed through the lamented death of Mr. MILL, the historian of British India who had been empowered to draw it up.

This then was the moment for the Society, to shew its gratitude to the distinguished individuals whose influence and talents had been so warmly exerted in supporting their memorial. Professor WILSON and Sir GORE OUSELEY, were already on the list of their Members; to them nothing more than their warmest

thanks could be proffered : but to the Right Honorable President of the Royal Asiatic Society, to Sir ALEXANDER JOHNSTON, and to Sir G. STAUNTON, were due the highest compliment the Society was capable of paying.

He begged therefore to propose, that these gentlemen be elected honorary Members, without the usual form of reference to the Committee of Papers, and that letters of thanks be addressed to each for the cordial support they had given to the cause of Oriental literature.

After a few objections on the score of departure from established form, and want of full official information, the proposition was put from the chair and carried Nem. Con.

A letter from Professor RAFN, Secretary of the Royal Society of Northern Antiquaries at *Copenhagen*, acknowledged receipt of Asiatic Researches, xiii.—xviii., and forwarded the Society's Reports for 1836. One addressed to the English Members, contains an account of Iceland from the oldest Icelandic records.

Professor O. FRANK of *Munich* acknowledged receipt of the *Muhabhd-rat*, vol. ii.

The Secretary of the Antiquarian Society, ditto of the xxth vol. As. Res.

The following Report of the Committee of Papers on the subject of the Museum, was read :—

TO JAMES PRINSEP, Esq.

Secretary to the Asiatic Society of Bengal.

Report of the Committee of Papers on the Museum Question.

The Committee having perused Dr. PEARSON'S Report on the operations of the Museum for the second experimental year, and having examined the state of the objects of Natural History, acquired, set up, and arranged under his superintendence, is of opinion that the Society is much indebted to his zeal and exertions, and that the sum voted for the support of the Museum in May, 1835, and renewed in May, 1836, has been well bestowed and profitably expended.

2. That nothing less than the actual demand for the Society's income on other objects imperatively necessary, such as the publication of its Researches, and the repair of its premises, would warrant the withdrawal of support from a department every day becoming of greater magnitude and importance; but that the following estimate of the receipts and payments of the Society for the ensuing twelve months, renders this continuance of the Museum establishment on the Society's present means, inexpedient.

Estimated Receipts, for 1837-8.

Cash balance in the Bank of Bengal,	652	14	1
Interest on the Papers deposited with the Government Agent, ..	835	0	0
Quarterly contributions,	6,500	0	0
Allowance from Government for Oriental library,	936	0	0
	<hr/>		
	8,923	14	1

Estimated Charges.

Arrears of Establishment for March and April, 1837, ..	563	11	0
The Museum allowance for April,	213	5	4
Subscription to Journ. As. Soc., for 1836, not yet paid, ..	1,293	0	0
Establishment and charges for 12 months,	3,200	0	0
Subscription to the Journal Asiatic Society, for 1837, ..	1,500	0	0
Ditto to the Oriental Translation Fund in England, 10			
guineas per annum,	200	0	0
To printing 2nd part of the 19th vol. As. Researches, ..	2,500	0	0
Cleaning and painting the house exclusive of any alter-			
ation and repairs,	900	0	0
	<hr/>		
	10,370	0	4

Deficiency, Co.'s Rs... 1,446 2 3

without estimating even a reduced allowance for the maintenance of the Museum.

3. That, viewing the maintenance of the Museum as a national object, and calculated to be of immense importance to science if placed upon a footing of efficiency, with a professional Naturalist at the head, directing researches and

systematizing information obtained from various sources, both public and private, in all the branches of physical science, but more particularly in regard to the Natural History of British India and Asia at large; it is incumbent on the Society to make a full and urgent representation to Government on the subject, and to solicit such support as is accorded in most other countries to similar institutions of national and scientific utility.

That historical, antiquarian, and statistical researches, although they may not demand so large an outlay as the prosecution of physical inquiries, merit equally the Society's attention, and the encouragement of Government, and should be included in the proposed representation, and that therefore a yearly grant of 10,000 rupees should be solicited in aid generally of the objects of the institution.

4. That pending the application to Government for pecuniary assistance, it is desirable to maintain the Museum on its present footing, and to retain the services of Dr. PEARSON as Curator, from month to month, until the question be decided.

EDWARD RYAN,

For the Committee of Papers.

Proposed by Mr. W. CRACROFT, seconded by Mr. E. STIRLING, and carried unanimously, that the Report be adopted by the Society.

The Secretary then read draft of the proposed application to Government, which was ordered to be circulated in the Committee of Papers and forwarded without delay.

Library.

The following Books were presented.

Straker's Catalogue of a collection of Oriental MSS. for sale in London.

Commentaire sur le Yaçna l'un des Livres Religieux des Parses, par. M. Eugene Burnouf, Membre de l'Institut, Professor de Sanscrit au College de France, tome 1. Part II.—*by the author.*

Memoirs sur Deux Inscriptions Cuneiformes trouvées pres d'Hamadán et qui font mainteuant partie des papiers du Dt. Schulz, by ditto—*ditto.*

Memoire sur le Guacharo (Steatornis Caripensis) (Humboldt) par M. L'Herminier. D. M. P.—*by M. Fortuné Eydoux through Professor Goodeve.*

Ditto sur L'Dodo, autrement Dronte (Didus ineptus), par H. D. De Blainville—*ditto ditto.*

Gita Govinda Jayadevae Poetae Indici Drama Lyricum, by Christianus Lassen—*presented by the author.*

Journal of the Royal Asiatic Society, No. VI.—*by the Roy. As. Soc.*

Census of the Armenian population of the city of Calcutta, by Johannes Avdall, Esq.—*by the author.*

The following books were received from the Oriental Translation Fund.

Harivansa, or Histoire de la Famille de Hari, par M. A. Langlois, tome 2.

Laili and Majaun, a Poem, from the original Persian, by James Atkinson, Esq.

The History of the Temple of Jerusalem, translated from the Arabic, with Notes and Dissertations, by the Rev. James Reynolds, B. A.

Kan-ing p'ien, Le Livre des recompenses et des Peines en Chinois et en Francais, par Stanislas Julien.

Chronique D'Abou-Djafar Mohammed Tabar, fils de Djarir fils d'Yezid, par Louis Dubeux, tome 1.

The following books were received from the Booksellers.

Lardner's Cabinet Cyclopaedia—*Russia*, Vol. II.

—————*Reformation*, Vol. II.

—————*Swainson's Birds*, Vol. I.

Wellesley's Dispatches, Vols. II. and III.

Correspondence of Clarendon and Rochester, and two vols. of Lardner's Encyclopaedia received from home at the charge of J. S. STOFFORD, Esq. to replace those lost by the wreck of a pinnace last year.

Baboo RAM COMUL SEN presented a copy of the catalogue of the Sanskrit works in the College of Benares, for publication with the catalogue of the Society's books now in the press.

The Government of Bombay presented 5 copies of Lieutenant T. S. CARLESS' Survey Report of the Indus navigation below *Hyderabad*.

The Right Honorable the Governor General forwarded a copy of Professor WHEWELL'S Researches on the Tides, 6th series: with a request that the Society would undertake to promote inquiries on the Indian coasts to complete the theory of cotidal lines for the Bay of Bengal, towards which the Government would be happy to contribute its aid.

This sixth series of Professor WHEWELL'S researches gives the results of an extensive system of combined observations in Europe and America in June 1835, which have produced a very material improvement in the map of the cotidal lines before published.

The most curious and important branch of the investigation is that for determination of the *diurnal inequality*, or difference between the day and night tide, which depends on the declination of the moon north or south of the equator. The existence of this inequality has long been known, but its laws have been misunderstood, and it has never been attended to in tide tables, though of material importance in the navigation of river mouths and shallow seas.

It was resolved that a circular should be addressed to members and correspondents of the Society residing on the coast stations, requesting their aid in procuring data for the tides of the Indian Ocean, and furnishing a copy of Professor WHEWELL'S instructions, printed in the Journal in 1833.

Mr. W. H. MACNAGHTEN presented two works in the Marhatta and Hindi languages: the *Siddhānta Siromani prakasa* by SUBHA'JĪ BĀ'PU, and the *Bhugola saro likhyate*, by ŚRĪ UNKARA BHAT JOSHĪ, written for the purpose of explaining the correct system of astronomy to their countrymen.

Mr. MACNAGHTEN also exhibited to the meeting two handsome silver emblematical inkstands, representing a jotishi pandit seated between two globes, expounding their use from the Siddhāntas—and around the stand, richly embossed, the twelve signs of the zodiac—a Sanskrit couplet on each expressing that it was presented by the Governor General in Council in token of approbation of the astronomical learning and zealous endeavours of the pandits to enlighten their countrymen. The following extract of a letter from Mr. WILKINSON, Governor General's Agent at Bhilsa, describes what they had done to deserve so high a compliment.

"I had shortly before entertained in my private service a Siddhāntī who possessed a higher degree of knowledge of his profession, and having had an opportunity of making myself whilst at *Kota* in some degree acquainted with the Hindu astronomical books, I had communicated a knowledge of them to my own Shāstrī, by name SUBHA'JĪ BĀ'PU, a man of wonderful acuteness, and intelligence, and sound judgment, and to UNKARA BHAT, one of the principal Joshīs of this part of *Malwa*. The arguments by which I had for the previous eight years of our connexion in vain endeavored to impress on SUBHA'JĪ BĀ'PU a conviction of the truth of the real size and shape of the earth and of other important physical facts, now carried to his mind the clearest conviction when shewn to be precisely the same as those of their own astronomical authors. His was the master mind; and it exercised its influence over the minds of all the other pandits. He was lost in admiration when he came fully to comprehend all the facts resulting from the spherical form of the earth, and when the retrogressions of the planets were shewn to be so naturally to be accounted for on the theory of the earth's annual motion, and when he reflected on the vastly superior simplicity and credibility of the supposition that the earth had a diurnal motion, than that the sun and all the stars daily revolve round the earth, he became a zealous defender of the system of Copernicus. He lamented that his life had been spent in maintaining foolish fancies, and spoke with a bitter indignation against all those of his predecessors who had contributed to the wilful concealment of the truths that once had been acknowledged in the land.

"SUBHA'JĪ BĀ'PU'S first care was how he was to enlighten the people of *Chanda* and *Nagpore*, the land of his birth. At *Bombay*, *Calcutta* and *Madras*, and at *Dehli* and *Agra*, and here also, the truth he said must spread, but how will the mid-land of *Nagpore*, visited by no travellers from foreign countries, accessi-

ble to no ships from other islands, and maintaining no schools,—how will the eye of its population be opened? I recommended his embodying all the facts he had learned in a treatise in Marhatha. He immediately undertook the work. I have got it printed, and I now have the honor of submitting two copies of the work, with a request that they may be presented to the Governor General of India.

"It is a work which will bear the test of even a severe criticism. It is full of philosophical reflections. From the different productions of different countries mutually necessary he argues the intention of providence to unite all mankind by commerce in the bonds of an interested affection. He hence infers the restrictions laid on Hindus against travelling to foreign countries to be violent and unnatural. He assails the folly of astrological predictions, and upholds the wisdom and mercies of Providence in veiling the future from our curiosity, and in keeping us all instant in our duties by an unfailing hope. He leaves none of the numerous vulgar errors held by all Hindus in connection with his subjects of geography and astronomy to pass without a complete and satisfactory refutation.

"UNKARA BHAT, who holds the next rank in talent and usefulness, has written a free Hindi version of SUBHA'JI' BA'PU's book on the Paurānic, Siddhāntic and Copernican systems."

Read a letter from Lieutenant KITTOE, stating that he had dispatched a cart to *Tamlook* to take down the *Bhubaneswar* slabs, the restoration of which had given the greatest satisfaction to the priests and people.

Lieutenant KITTOE also forwarded copies of the principal inscription in the old Lāt character at *Aswastuma* near *Dhoulee* in *Orissa*, with a short account of the caves and temples discovered there by himself and a map of the place.

[This inscription will be seen to have arrived at a most fortunate moment.]

Captain SMITH, Engineers, forwarded accurate facsimiles of the inscriptions at the Buddhist monument of Sanchi near *Bhilsa*; with a paper describing their position; and

Captain W. MURRAY presented some beautiful drawings of this very curious mound, and of the highly ornamented stone sculpture of its gates and frieze.

The Secretary read a note on the inscriptions, which had proved of high interest from their enabling him to discover the long-sought alphabet of the ancient Lāt character (or No. 1 of *Allahabad*)—and to read therewith the inscriptions of *Delhi*, *Allahabad*, *Bettiah*, *Girnar* and *Cuttack*—all intimately connected, as it turns out, in their origin, and in their purport.

Lieutenant KITTOE also presented facsimiles of a copper grant in three plates dug up in the *Gumsur* country, of which the Secretary with the aid of KAMALA KANT Pandit supplied a translation.

It relates to a grant of land by the *Bhanja* rājas to a brāhman named *Bhand-reswara*.—A lithograph will be published shortly.

The Honorable G. TURNOUR transmitted a paper on an examination of the Pāli Buddhistical Annals, including a translation of the *Atthā kathā* of BUDDHAGHOSI, and a table of the *Pitakattayan*.

This paper will appear, at as early a period as possible.

Major J. SLEEMAN, communicated the first part of his *History of the Gurha Mundela Rājas*.

We shall also hasten to lay this before our readers.

Lieutenant SIDDONS forwarded a translation of the commencement of the *Dadupaṭhī Grantha*, with a promise to continue the same should it prove acceptable.

Professor WILSON formerly intended to have done the same thing—the translation of DADU's moral instructions is highly interesting.

A list of the native tribes in *Sinde* and specimen of their language was communicated by Captain ALEXANDER BURNES from *Bahāwalpur*.

Physical.

G. LOCH, Esq. C. S. forwarded for presentation to the museum a second collection of the butterflies and insects of *Silhet*.

Dr. T. CANTOR presented some fragments of bones *perfectly fossilized*, extracted from the superficial clay at *Rangafulla* below *Diamond Harbour*.

In these bones the animal matter is entirely replaced by iron and carbonate of lime, although they were imbedded in quite a modern alluvium. Their discovery throws a new light either on the period required for fossilization, or on the age of the alluvium.

Mr. W. T. LEWIS of *Malacca*, presented the model of a Chinese double bellows for the museum; also some tin and gold ore.

The Tapir sent up by Lieutenant MACKENZIE had, with the Committee of Papers' sanction been made over to the Secretary, it being out of the Society's views to keep living animals.

Mr. B. H. HONGSON forwarded some beautiful Zoological drawings for inspection on their way to *Europe*; also two bottles of the snakes peculiar to *Nipal*.

Lieutenant HUTTON presented a notice of the Indian Boa *Python Tigris*.

A letter from Professor S. VON DEM BUSCH, of *Bremen*, proposed exchanges of land and fresh-water shells and other objects. Referred to the Curator.

Dr. T. CANTOR presented drawings and a notice of one of the fossils in the Colvin collection which had been cleared from matrix for the purpose of examination.

It proves to be the skull of a gigantic fossil Batrachian, and by comparison of the relative measurements of the common frog, it must have belonged to an animal of 40 inches in length!—a proportion between fossil and recent species which has its parallel only in the neighbouring family of reptiles, the salamanders, of which the specimen from the Oeningen schist known by the name of *Homo diluvii testis*, measured three feet in length.

The following notice of a curious natural phenomenon observed in the Red Sea was communicated by Captain A. BURNES from *Bahawalpur*.

Extract of a letter from Lieutenant WELSTED of the Indian Navy, dated Mount Sinai, September 26th, 1836.

"You once expressed a wish to know something of the *Djibbel Narkono* or sounding mountain, concerning which there has been so much doubt and discussion in *Europe*. I visited it on my way here—it is situated on the sea shore about eight miles from *Tor*. A solid slope of the finest drift sand extends on the sea face from the base to the summit (about six hundred feet) at an angle of about 40° with the horizon. This is encircled or rather semicircled, if the term is allowable, by a ridge of sandstone rocks rising up in the pointed pinnacle, and presenting little surface adapted for forming an echo. It is remarkable that there are several other slopes similar to this, but the sounding or rumbling, as it has been called, is confined to this alone. We dismounted from our camels, and remained at the base while a Bedoin scrambled up. We did not hear the sound until he had attained a considerable height. The sound then began rolling down, and it commenced in a strain resembling the first faint notes of an Eolian harp, or the fingers wetted and drawn over glass—increasing in loudness as the sand reached the base, when it was almost equal to thunder. It caused the rock on which we were seated to vibrate and our frightened camels (animals you know not easily alarmed) to start off. I was perfectly astounded, as was Captain M—— and the rest of the party. I had visited it before in the winter month, but the sound was then so faint as to be barely evident, but now the scorching heat of the sun had dried the sand and permitted it to roll down in large quantities. I cannot now form the most remote conjecture as to the cause of it. We must not I find now refer it to the sand falling into a hollow, that might produce a sound but could never cause the prolonged *vibrations*, as it were of some huge harp string. I shall not venture on any speculation, but, having carefully noted the facts, I shall lay them, on my arrival in England, before some wiser head than my own, and see if he can make any thing out of them."

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1837.

Day of the Month.	Observations at 10 A. M.					Calculated Humidity.		Observations at 4 P. M.					Calculated Humidity.		Register Thermometer extremes.		Wind.	Weather.	
	Old Stand.	Barometer at 32°.	New Stand.	Thermome- ter in air.	Depression of wet-bulb.	Do. by Les. Hygro.	Dew-point.	Half Hy- grometer.	Centesimal tension of vapour by wet-bulb.	Do. by hair Hygrom.	Ditto by dew-point.	Cold on roof.	Heat in sun's rays on roof.	Rain.	10 A. M.	4 P. M.		Morning.	Evening.
1	29.762	76.76	76.88	0.1	8.7	74.7	87		65	72	60	79.8		1.90	se.	se.	cumuli. overcast.	threatg. hazy.	
2	820	760.81	4.8	5.0	76.4	91	80	80	80	70	80	66.0		1.25	ne.	E.	do	cumuli.	
3	832	757.83	3.2	8.4	74.0	86	80	81	67.0	69.0	81	66.0		0.05	sw.	sw.	cir. cum.	cir. cum.	
4	769	795.85	3.0	9.0	73.9	88	82	74	89	65	76	70	67.9		sw.	sw.	cir. stra.	cir. stra.	
5	838	806.83	6.4	5.3	74.1	92	72	82	75	70.0	66.0	82	73.9		sw.	sw.	cir. stra.	fine.	
6	846	810.85	6.4	6.4	74.0	91	70	80	78	70.0	66.0	82	73.9		sw.	sw.	cum.	do	
7	828	781.87	7.4	6.6	76.8	92	70	82	72	69.0	63.0	80	73.9		sw.	s.	do	do	
8	769	789.84	7.2	6.0	77.8	91	71	80	73	69.0	63.0	80	73.9		sw.	s.	do	do	
9	853	800.87	6.7	5.3	73.0	95	71	80	71	73.0	66.0	81	73.9		N.W.	sw.	drizzle.	overcast.	
10	831	797.86	6.9	6.3	75.2	91	71	80	71	73.0	66.0	81	73.9		W.	sw.	cloudy.	threatg. clear.	
11	794	795.86	14.3	13.0	77.8	98	78	88	73	65	58	58	74.8		S.	sw.	do	clear.	
12	786	790.89	12.0	11.3	77.5	92	75	83	61	61	45	46	76.7		sw.	sw.	do	clear.	
13	864	807.90	10.1	10.1	75.2	87	82	72	62	62	31	35	79.0		sw.	sw.	do	do	
14	830	804.91	9.3	8.3	77.7	88	63	74	67	54.0	48.0	40	80.0		sw.	sw.	do	do	
15	869	803.91	9.1	8.1	77.3	83	66	74	65	56.0	51.0	44	79.8		sw.	sw.	do	do	
16	870	803.91	9.1	8.1	77.3	83	66	74	65	56.0	51.0	44	79.8		se.	sw.	do	do	
17	713	652.91	8.3	9.1	77.2	89	70	78	69	57.0	52.0	44	79.8		se.	sw.	do	do	
18	709	652.91	8.3	9.1	77.2	89	70	78	69	57.0	52.0	44	79.8		sw.	sw.	do	do	
19	847	807.90	10.1	10.2	73.0	84	62	76	60	54.0	48.0	40	80.0		sw.	sw.	fresh breeze.	fresh breeze.	
20	897	808.91	9.3	9.6	75.6	89	64	76	64	51.2	43.4	45.6	75.0		sw.	sw.	clear.	clear.	
21	824	806.90	10.1	10.0	75.0	87	60	76	62	50.5	44.1	45.9	73.6		sw.	sw.	cumuli.	clear.	
22	824	806.90	10.1	10.0	75.0	87	60	76	62	50.5	44.1	45.9	73.6		sw.	sw.	cum. stra.	hazy.	
23	869	809.92	3.1	7.1	76.0	89	57	68	57	50.0	50.0	50.0	79.0		sw.	sw.	do	do	
24	869	809.92	3.1	7.1	76.0	89	57	68	57	50.0	50.0	50.0	79.0		sw.	sw.	do	do	
25	875	815.91	10.1	10.1	75.2	87	60	76	60	50.0	50.0	50.0	79.0		sw.	sw.	do	do	
26	875	815.91	10.1	10.1	75.2	87	60	76	60	50.0	50.0	50.0	79.0		sw.	sw.	do	do	
27	843	803.91	9.3	9.1	75.0	88	62	74	61	49.4	43.8	44.5	73.6		sw.	sw.	do	do	
28	816	809.94	9.3	8.2	75.0	88	65	76	61	49.4	43.8	44.5	73.6		sw.	sw.	cir. cum.	fresh breeze.	
29	832	808.90	8.6	8.6	75.0	92	72	82	61	49.4	43.8	44.5	73.6		sw.	sw.	cir. stra.	haze.	
30	867	816.92	7.7	8.2	76.5	92	72	82	61	36.0	29.0	29.0	83.0		sw.	sw.	do	fresh breeze.	
31	854	823.93	8.6	9.3	76.6	90	63	78	59	37.8	30.2	30.2	83.0		sw.	s.	do	cumuli.	
Mean, 29.709	600.93	0.0	8.9	75.2	88	64	74	65	59.55	523.	94.8	14.9	14.7	73.2	79	59	50	77.8	South.

Finding so great a discrepancy in the tension shown by the half hygrometer I have recomputed the hundredth degree or extreme moisture and find it to reach 102.5 which will necessitate a correction to the amount of about 6 per cent. being a new hair, it had not become properly stretched when first set up.—J. P.



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